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THE NATIONAL GEOGRAPHIC MAGAZINE

JULY, 1922

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38 Species Illustrated in Full Color

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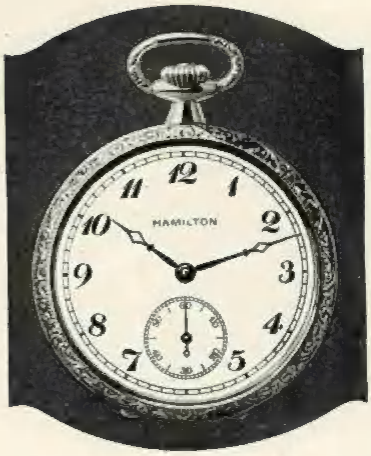

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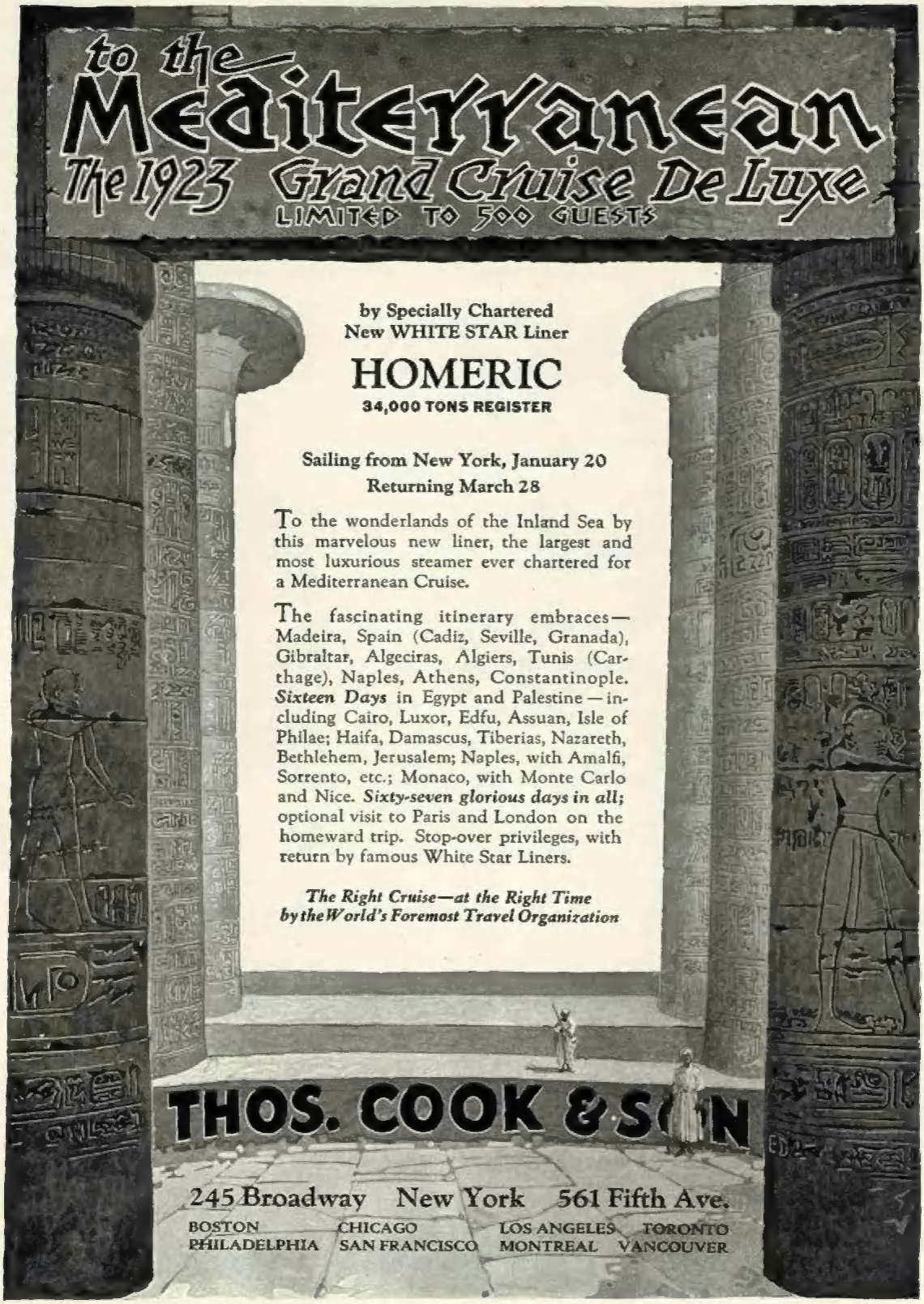
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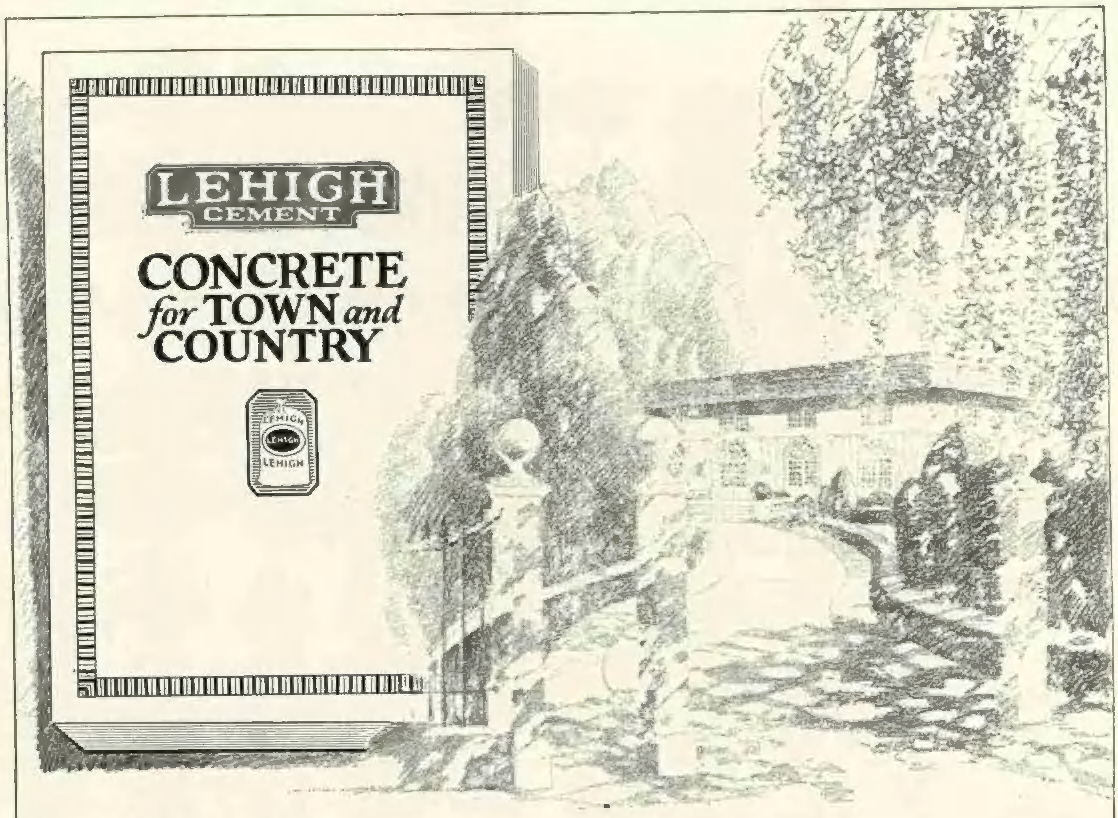

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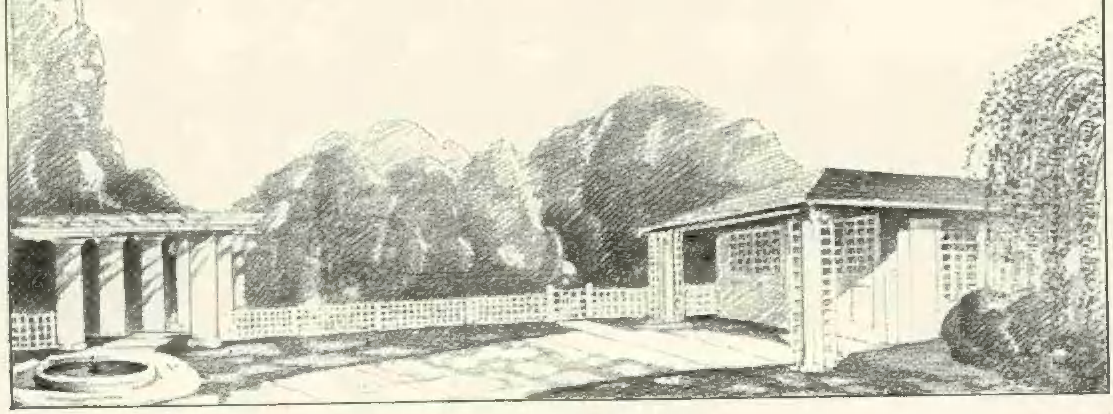

THE savage mountain tribes rolled huge boulders down on the invaders, but Hannibal only laughed. "Though the mountains topple upon us," he vowed, "our swords shall drink deep in Rome!"

The Value of Time

By Krónos

Painting by HAROLD DeLAY

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* * * * *

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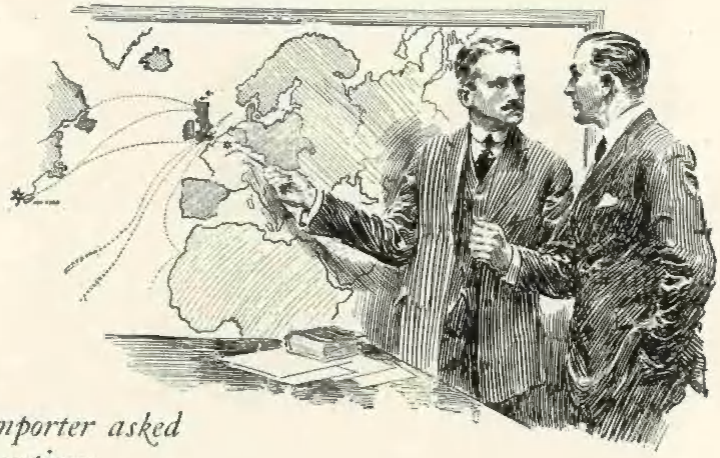

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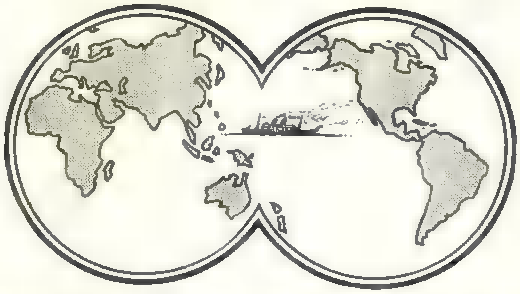

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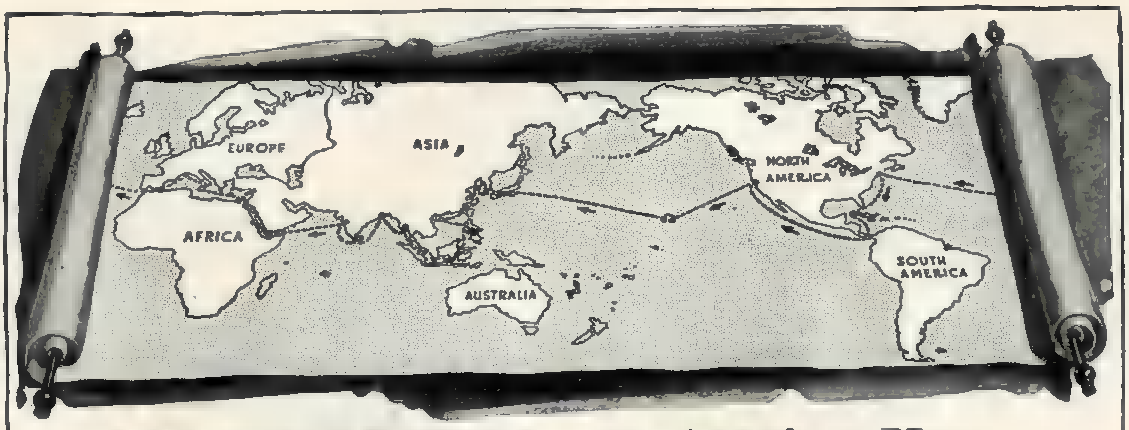

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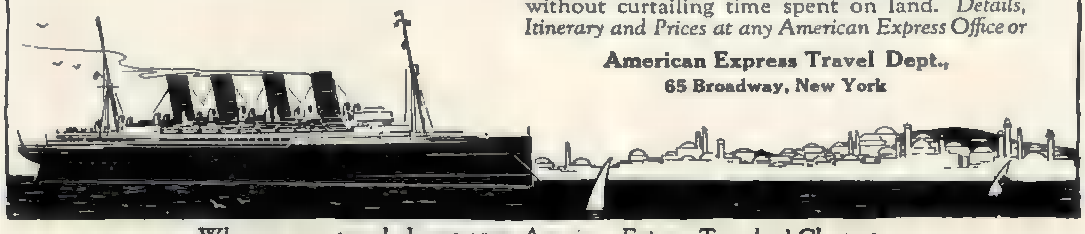

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CAMARGUE, THE COWBOY COUNTRY OF SOUTHERN FRANCE

By Dr. André Vialles

With Illustrations from Photographs by Clifton Adams, Staff Photographer, National Geographic Magazine

WHEN the Roman legions were encamped in Gaul the delta of the Rhône was the granary of the imperial armies. Today desert wastes and malarial swamps have so enveloped the Camargue that its dashing herdsmen and beautiful horsewomen have not yet fully rescued it.

Given over to herds of horses, cattle, and sheep, this cowboy land is little known, even by the people of France, although some of the most distinguished French men of letters have paid tribute to its simple folk.

At Arles the hitherto swift Rhône divides into two sluggish streams, whose floods, combined with the waves of the tideless Mediterranean, have built up an alluvial plain which is inherently rich, but which was despoiled by Louis XIV in much the same way that the fertile fields of Babylonia, ruined by Assyrian and Persian, became the desolation of modern Mesopotamia.

History clusters richly about the Camargue. Phœnician traders came hither to trade with the Ligurians even before the Greeks founded Marseille. When that port was threatened, appeal was made to the Romans, who thereupon invaded Gaul, and from the Provincia Romana, Provence gained its name. In the third century of the Christian era St. Trophimus established a church at Arles, which two centuries later became the capital of Gaul.

Then came the Visigoths and Ostrogoths to build Carcasonne, and the Franks, whom the Arabs later held in subjection until the advent of Charles Martel. Italy extended its power to the Rhône, and later the House of Barcelona added Camargue to its domain. Under Raymund of St. Gilles the people took so important a part in the First Crusade that the word "Provençal" came into common speech.

WHERE THE LANGUAGE OF THE TROUBADOURS DEVELOPED

With the fall of Rome the language of Cicero gave way to the vernacular of the slave, and this rude speech, passed on by word of mouth, not only triumphed over the Latin of the cloisters, but also developed into the rich language of the Troubadours.

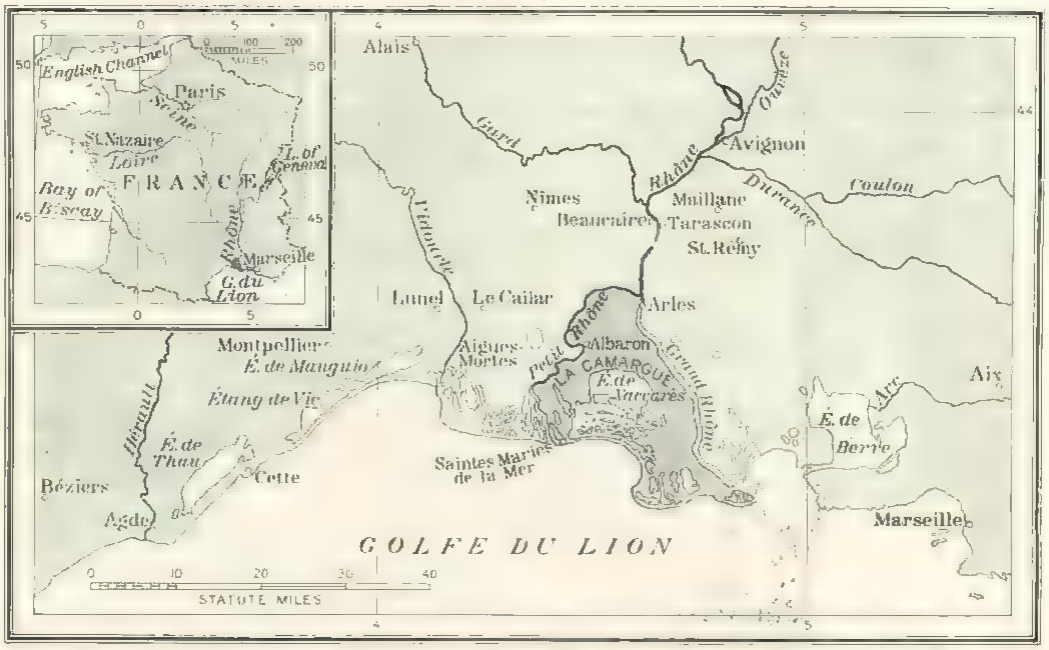
With the dispersal of the Albigenses came the unification of France, in which the geography of the north fought on the side of centralization, and the topography of the south, which fostered provincial pride, prevented such united strength as would avail against the kings of the north. Today, Camargue is a loyal part of the Republic, but proud of its own institutions and language.

Were it not for the intense pride and love of their home land on the part of

YOUNG COWBOYS OF CAMARGUE

In addition to the lariat of horsehair, their equipment includes a trident, which has many uses in handling the spirited cattle of the marshes.

A CAMARGUE FARMHOUSE WITH BARN AND DWELLING UNDER ONE ROOF, AND WITH WELL AND SMALLER OUTBUILDINGS NEAR BY



Drawn by James M. Darley

LA CAMARGUE, THE ISLAND "WILD WEST" OF SOUTHERN FRANCE

It lies between the two main arms of the River Rhône and is 26 miles long with a mean width of 11 miles.

the people of Provence and Languedoc, the Camargue might be given over to waste. But local patriotism, founded on poetry, horsemanship, and such love of the land as comes from outdoor life among the herds, is rehabilitating the region which once rivaled in richness the delta of the Nile.

IRRIGATION IS RECLAIMING THE DESERT

Now irrigation is making the desert blossom and the vineyards grow, and drainage is reclaiming the swampy wastes. Highroads have been constructed along elevated bunds, shaded by umbrella pines, and railways laid across the moor, thus opening up the Camargue to easy access from the outside world. But the customs and traditions of the land preserve the mellow flavor of the olden days when Vincèn visited Mirèio at the *mas* on Lotus Farm.

Among the clumps of scrubby tamarisks dotting the landscape like tiny islands on a dead-calm sea may be found a great variety of game. From all sides come flocks of sea-ravens, plovers, herons, and wild ducks of all sorts. On the shallow borders of the marsh stand lines of pink flamingoes. Sometimes a blue Egyptian ibis strays this way.

On the salt moor the rabbit multiplies as in Australia, in spite of the inroads made by the sportsmen, who are not forced to depend upon cap hunting, as was the mighty hunter Tartarin. Beavers which were numerous many years ago, are still found on the banks of the Rhône, and small land-tortoises are often seen.

When you have crossed the wonderfully fertile lands, where crops and vineyards grow, you enter the wild Camargue. It is a marshy plain reaching to the shores of the sea. Thereon is found the *sansouiro*, the salt moor, and what scanty vegetation may grow along these marshes.

The extraordinary feature of this wild section of France is the great herds of bulls and horses grazing peacefully, with flocks of sheep nibbling the scant grasses of the desolate moor.

THE MISTRAL, THE GREAT MUD-EATER

Camargue is a land of cloudless skies and a hot sun, sometimes dangerous in its intensity. But down from the cold central plateau of France there sweeps the mistral, a chilling wind which blows,

on an average, one day in every two. One might well picture Camargue as the setting for the well-known contest between the blustering wind and the genial sun, to see which could first force the traveler to remove his cloak.

The mistral's power is such that the roofs of the humbler homes and cowboy shelters hang low to withstand the force of the dry, cold wind, often cyclonic in power, and a cross is fixed to the wall as additional protection. But, cold as the mistral is, it is a blessing, for the malarial mosquitoes and miasmic vapors of the land cannot withstand its blasts, and the muddy morasses dry up before its cleansing breath. For this reason it is called the "great mud-eater."

The mistral is perhaps the main factor in the environment of the land; and, by a strange coincidence, a newer force which has influenced the region bears the same name. One might well call this part of Provence the land of the two mistrals. So simply and beautifully have the poems of Frédéric Mistral described the herdsman's land and life that one of them, *Mirèio,* won for him the Nobel prize for literature in 1904 and the lasting love of his people. Before the great poet of Provence died, in 1914, he had the satisfaction of knowing that his art had given new life to his land and new pride to its people.

A MOTHER'S TEARS INSPIRED THE REBIRTH OF A LANGUAGE

Frédéric Mistral had a great teacher, Joseph Roumanille, a gardener and poet, whose love of his native tongue was stirred by a trifling incident. Roumanille was once reading one of his own poems in French to some friends who were gathered in his home. Praise came to the lips of his fellow-artists, but to his mother's eyes came tears, because she could not understand this strange tongue, although she was a native of France.

Roumanille then decided to work for the reëstablishment of the language of the Troubadours. The finest flowering of modern Provençal is *Mirèio,* in which his pupil, Mistral, describes the simple country life and the love of a basket-weaver's son for the daughter of one of the rich farmers of Provence. Thus was the recent renaissance of Provençal literature mothered by a tear and sired by a song.

Mistral, thrilled by Homer and the Eclogues of Virgil, awakened anew the native speech of Provence, changed the provincial patois of St. Rémy into the proud Provençal of the Avignon School, mended the rifted lutes of the Troubadours and made their muted strings respond again to the rich sonority of the native tongue.

NATIVE DANCES, SPORTS, AND COSTUMES CONSERVED

Master of phrases that he was, Mistral was also a master of psychology. He saw dances, sports, and costumes as the unifying factors in a native life which was threatened by the melting pot of cosmopolitan civilization, and he sought in every way to conserve all such native elements as would make for happiness and patriotism, for race expression and for individual glory.

Hence when one watches the people of Camargue, gathered to witness bullfights in which the beast has an equal chance with the unarmed man, or sees the horsewomen dashing side by side with their husbands, fathers, and lovers in the *abrivado,* he is witnessing not alone a holiday spirit exulting in comradeship and excitement after the solitude of the endless plains, but also the fusing of a freedom-loving folk into a unit which has recently won official recognition from the France of which it is so unusual a part.

When the visitor gazes at the village maidens, whose colorful costumes add zest to the "Feast of the Virgins," he is noting one phase in a cultural renaissance whose importance cannot be realized until history has shown what fruit develops from this bright flower of beauty and unsophisticated charm.

THE CAMARGUE HERDSMAN

The herdsman of the Camargue is a picturesque figure. Living a lonely life among herds of black cattle and wild horses, he has developed the same manly traits that distinguish your Western cowboy. Courage, chivalry, determination, endurance—all are his. But individualism and self-reliance left small place for patriotism, and it was here that the poet hoped to round out the character of the fearless desert rider.

Hence the *rodeo,* or round-up, has become a cultural conference, during which

THE CAMARGUE COWBOY, HIS STEED AND HIS OUTFIT

When he rides the range on his faithful little white broncho, he carries a horsehair lariat in the bag over his shoulder. The trident, used for the wild bulls, is not necessary in handling horses.

THE EXCITING DASH OF THE "ABRIVADO": BRINGING THE BULLS FOR THE FIGHT

The Camargue has its own form of gantlet. The herders must drive the fighting bulls through the streets, while the townspeople do everything in their power to scatter the animals (see text, page 28).

THE BLACK HERDS OF THE CAMARGUE

In parts of Provence the pasturage is rich and a few cowboys, armed with tridents, can control a large herd. In other regions the sparse pasture demands more helpers to keep the ever-moving herds in order.

A REFUGE MADE OF REEDS AND THE HULL OF AN OLD BOAT, USED BY CUSTOMS OFFICERS AS A LOOKOUT POST, NEAR THE MOUTH OF THE LITTLE RHÔNE

the freedom-loving *gardians*, or herdsmen, impress upon themselves the mark of Provence while they brand their cattle with the initial or heraldic emblem which distinguishes their live stock.

The women have not been neglected in this plan to unite the people of Provence into a happy family of families. Their lovely dress has been revived and the fashion dictates of Paris repudiated in favor of a costume which was not only the costume of their mothers but which is beautiful in its own right.

THE "MAS," THE HOME OF THE PEOPLE

Before inspecting the *ferrade*, the *abrivado*, and the fight for the cockade, let us visit the *mas*, the farmhouse home of the Provençal herdsman. His interest is in his ranch and herds, but home means the more to him for all that. Nor is he ashamed to live under the same roof with his animals or harvest. The flavor of the soil permeates the very home life of the Camargue peasant.

Near the house one is sure to note the tree or trees which add distinction to the spot. Trees are few and far between in the Camargue. The graceful poplars, which add charm to more sheltered parts of Provence, are seldom found between the two main mouths of the Rhône, for such towering stateliness cannot withstand the unrelenting blasts of the mistral; but a clump of stout, low trees or somber cypresses is fostered by the farmers of the Camargue much as the solitary trees of Palestine are protected by the guardians of the holy tombs of the saints.

The rude well without a sweep, the creaking grindstone, the clutter of outworn tools, the peculiar spindle for making the *sedeu*, or horsehair lariat, the rickety ladder, the small stacks of coarse fodder—these are the homely features that surround the mas.

To an extent that is not common in cities, the mas is the true home of the people. In an inhospitable land, the home is the welcome retreat of host as well as stranger. The warm hearts and hearths of Camargue are ample compensation for the desolation of the outer world.

The welcome is no less sincere because the newcomer is himself an entertainer, who, grateful for the cheer which so surrounds him, warms to his happy task as guest and with each draught of wine radiates good will and confirms the host in his cordiality.

The genial host breathes the very air of hospitality, but his wife has also done her best to add a note of homelike charm to the scene. The plaster walls are hid behind great masses of wisteria or the deep blush of the Judas-tree. As in the windows of Russia's log houses, so here the humble geranium gives its bright touch of velvety color to the dusty scene and sweet-smelling beds of flowers triumph over the homely odors of the stable.

THE HOUSEWIFE'S REALM

The kitchen is the housewife's realm, a large bare room with the whitewash toned like an old meerschaum and the rough-hewn rafters browned by the smoke from the wood fire which blazes merrily below the large black kettle on its smoky chain.

The great fireplace fills almost an entire side of the room, perhaps with a brick oven on one side and a masonry alcove for the few simple dishes on the other, while from the ceiling hang sprigs of drying herbs.

Here the humble housewife rules as queen, with a gay shawl about her shoulders and her high chignon, bound with black velvet and lace, taking the place of a crown (see page 16).

Primitive as are the arrangements, the cooking leaves nothing to be desired; for in the Camargue, where every one knows every one else, the virtues and failings of the people are retailed and rehearsed from one horn of the crescent that incloses the Étang de Vaccarès to the other, and lack of culinary skill would be as just a cause for feminine reproach as lack of courage to a man.

Just as Tartarin de Tarascon, whose delineation by Daudet makes sophisticated outsiders smile at his extravagances and envy him a little for his gruff leadership, so each herdsman has his reputation for skill, for strength, or for endurance, which gives him a justifiable pride of craft, and the culinary excellencies of his wife are equally well known.

The gardian of Camargue can be likened not only to the American cow-

A SLUICE-GATE IN THE CAMARGUE DRAINAGE SYSTEM

There is an extensive system of deep drainage ditches throughout the more fertile districts of the Camargue, and in the late winter and early spring the surplus rain water is drained off to the sea.

HELPING TO RESUSCITATE AGRICULTURE IN THE CAMARGUE

The herder's days are numbered here, as in many other parts of the world, and the pastoral life is giving way to the less romantic but more profitable occupation of agriculture. This is a return to the old order of things, for in the days of ancient Rome this part of Provincia Romana rivaled in fertility the delta of the Nile.

IRRIGATION MAY SOON MAKE THIS MONOTONOUS WASTE BLOOM

In traversing the Camargue desert south of the large expanse of water called the Pond of Vaccarès (see map, page 4), the seldom-used highway follows no fixed direction, but winds back and forth on the hard-packed sand.

A HAND-POWER BALING PRESS

With the return of irrigation and the adoption of modern methods, straw is coming into its own in the Camargue. This small baler requires only two men to operate it, and a more or less compact bale is turned out every few minutes.

EVEN COMMERCE IS NOMADIC IN CAMARGUE

In the town of Les Saintes Maries de la Mer the little stores and shops do not supply all the needs of the housewives, so traveling venders halt in the shade of the cathedral to display and sell their wares.

THE LURE OF THE READY-MADE

The Camargue is unusually self-reliant, but even in the tiny villages the fame of Marseille and Paris is not unknown, and when the itinerant vender arrives shopping is the order of the day.

THE HARD-BLOWING MISTRAL IS THE DRYER IN CAMARGUE'S OPEN-AIR LAUNDRIES

puncher, but also to the vaquero of Spain, to the gaucho of South American pampas, and to the rough riders of Australian stations or the South African veldt. He is, however, a special type, having more to do than protect cattle or horses. More than all else, the gardian is preserving the old traditions of the Camargue peasant, his customs, his melodious Provençal language, and something of his old-fashioned dress.

The gardian still wears a bright-colored shirt and a black coat lined with velvet. His trousers are of brown cloth, resembling leather, and are supported by a *taiolo*, a kind of large woolen belt several yards long.

In winter the gardian uses wooden sabots even when riding. Sometimes, as a protection against the cold wind and rain, he wears over his trousers high leggings made of calfskin and strapped to his belt. These leggings are similar to the American cow-puncher's "chaps." He also wears a wide-brimmed felt hat like the sombrero of the Western cowboy.

EVERY FAMILY HAS ITS APPRENTICE HERDSMAN

In nearly every family of herdsmen may be found an apprentice, or *gardiaoun*, chiefly distinguished by a passion for fighting cattle and a love of rough, open-air life.

Practicing with his father, uncles, or brothers, the boy soon becomes proficient in the cattle business. He must learn how to plait horsehair to make the seden or Camargue rope, and how to brand and wean the calves.

He must also learn to handle the long horseherd's staff and the gardian's iron trident, and follow the tracks of lost cattle over the wild salt moor.

To be a good herdsman he must know the different grass lands where the bulls and horses can graze and where to locate good holes at which to water them. Above all, the gardian must be a tireless horseman and rough rider, able to break the most unruly broncho to his will.

In winter the herdsmen live in the malarial marsh. When the great heat of summer hangs over the sun-burnt, dusty prairies they are ceaselessly tormented by swarms of mosquitoes, horseflies, and gnats.

Sober and inured to every hardship, they are patient and reserved, because of their solitary life among the cattle. That is why, at the religious festivals to which they drive their fighting bulls, they give

THE VILLAGE SMITHY OF LE CAILAR

HERE PRIDE OF CRAFT OUTLIVES THE COLOR OF ONE'S HAIR

The products of Monsieur Bonfort of Le Cailar have a hall-mark of their own. Here he is comparing a partly finished ficheiroun, or trident, with the carved walnut model into which a thousand tridents, scattered throughout the Camargue, would fit perfectly, although each one is forged by hand.

ALL CAMARGUE KNOWS HIS FAMOUS BRANDS

Monsieur Bonfort's tiny smithy is a favorite rendezvous of herdsmen. Whether it be to point a trident or form a cattle brand, this jolly blacksmith leads his field. Here he is putting the finishing touches on a cattle brand for a cattle king whose range lies far to the south.

vent to such surprising outbursts of boisterous gaiety.

THE GARDIAN'S TRIDENT

While mounted, the gardian uses a *ficheiroun*, or trident. This is a hand-forged piece of iron, of which the classic and ancient form is a half-moon with sharp horns and a third short, triangular point in the middle. This trident is helved on a staff seven feet long.

Gardians handle the ficheiroun with great cleverness. With it they throw down calves for branding or weaning, control unruly bulls, or stop a stampede in the herd, and on occasion protect themselves from attack. They also use the long staff in fording streams.

For these cowboys the trident is the emblem of free life. It has been employed as a theme for many Provençal poems and popular songs.

The poem of J. d'Arbaud is a familiar example: "O trident, arm of Provence—arm of captains and gardians—to preserve our old traditions, I hoist thee on thy staff of chestnut wood."

This trident of the cattle-herder might also stand as the emblem of the land, whose shape it so nearly resembles, for it is the mainstay of the gardian. About the new statue of Mistral's girlish heroine, in the Place Mistral of Les Saintes Maries de la Mer, is a low iron railing whose alternate prongs are trident heads (see illustration, page 22).

THE HERDSMAN'S HORSEHAIR LARIAT

While the sturdy ficheiroun is the rod and staff of the herdsman, of almost equal importance is the seden, a horsehair lariat, sometimes 36 feet in length, which is used as a lasso. It is never thrown from horseback, as it is light in weight and does not carry well in the air.

In making the seden, strands of horsehair are slowly spun from a rough bundle and tightly twisted by a heavy spindle, which is used in a horizontal position instead of hanging at the knee, as does the distaff of the spinners of the East.

The hair used in these sedens is carefully selected, not only for length and strength, but also for color. Strands of

MARIE, IN HER COSTUME OF OLD PROVENCE, BLOWS THE WOOD FIRE WITH THE OLD BELLOWS

In every farmhouse in the Camargue is a large, open fireplace in which most of the cooking for the family of the farm manager and the servants and laborers is done in old-fashioned utensils.

THE THRONE-ROOM OF THE CAMARGUE HOUSEWIFE

In the humble herder's home the kitchen is the heart of the house (see text, page 9).

THE CHARMING COSTUME OF THE ARLESIENNE HAS BEEN RESTORED TO FAVOR IN CAMARGUE

For a time there was danger of this lovely gown's being discarded for Parisian habiliments, but the wearing of the native costume has now become a point of pride, and this graceful belle of the Camargue looks as if she might have stepped down from some ancestral portrait gallery.

various colors are twisted into the final length, to form a pleasing pattern in white, brown, and black.

The projecting ends of horsehair give the seden a rough and fuzzy appearance, so that it does not look as if it would run freely in the noose. But the gardian handles it with ease and precision.

Seldom does the gardian carry firearms; but the Camargue is a great game country, and the owners of large estates, who trust their herds to unarmed cowboys, hire well-armed gamekeepers to protect the birds and wild rabbits (see p. 31).

Upon the wide webbing from which the gamekeeper's bag depends, there glistens a big brass badge, which serves as does the star of the constable in rural drama to identify him as "the law." His gun strap of plaited leather is a model of pliant strength.

THE DECEPTIVE CAMARGUE SADDLE MAY BE AN INSTRUMENT OF TORTURE

The cowboy saddle of the Camargue is as deceptive in appearance as is the meek-faced broncho. It looks like a deeply upholstered armchair perched upon a wide skirt of cowhide. One strongly suspects it of concealing a pair of shock-absorbers somewhere in its bulging sides.

Its high back is deeply padded and outlined with brass-headed nails in fancy designs. The wide curved pommel has no horn, but instead is tufted as luxuriously as is the cantle.

A tenderfoot would imagine that on such a saddle one need only worry about how long his horse would last. But to one unaccustomed to so soft a seat the Camargue saddle can be an instrument of torture whose pleasing appearance gives little clue to its deadly effect. After one has ridden the desert wastes for a few miles, the novice pictures a broadly bulging hogshead as a comfortable seat and fears that his legs are bowed for life.

The large hand-made stirrups of wrought iron are much more comfortable, for they hang low and are covered over in front with iron bars, so that the foot cannot slide through and let the stirrup branches bruise the ankles (see page 6).

The hand-forged spurs are short, with small rowels. From the high saddle-bow hang two leather pockets and sometimes two *saquetouns,* or bright-colored cloth bags.

The Camargue bridle is generally made of black leather, without blinders, with a hand-forged bit having long curved branches. A sort of hackamore is used to break in a horse.

THE WOMEN RIDE HORSEBACK BEHIND THE MEN

Only on horseback does one traverse the wild waste of marshes.

The gardians' wives and daughters ride into the salt moor behind their husbands or fathers. They sit securely upon a little blanket bound to the crupper, and with an arm around their chevalier they ride great distances across the drab landscape.

From ancient times there have been in the Camargue horsewomen passionately fond of cattle-raising and of rough riding. In the sixteenth century mention was made by Pierre Quiqueran de Beaujeu of horsewomen accompanying the gardians during the *ferrade,* or cattle-branding.

A few years ago there was in the Camargue a very celebrated horsewoman, Mlle. de la Borse-Caumont. Her father owned the bulls and horses of Mas d'Icard. Gardians called her the "Damisello," the Miss, and almost worshiped her.

Nowadays, especially in Languedoc, the number of horsewomen is increasing. They ride astride white Camargue horses saddled in true cowboy style, wearing a girl's riding skirt, a shirt of some bright color, and a large sombrero.

They are very fond of the cattle business, follow the gardians at their daily tasks, and are always to be found in the thickest of the exciting charges of the abrivado.

THE VILLAGE SMITHY OF CAMARGUE'S CHEYENNE

One of the humble heroes of the Camargue would suit Longfellow better than Daudet. He is the village blacksmith of Le Cailar, the focus of gardian life, and the Cheyenne or Pendleton of Provence (see pages 14 and 15).

In his tiny smithy, this jolly Monsieur Bonfort fashions the tridents for his cowboy friends or forges the brands with which the roving herds are marked. None can design a finer pair of stirrups than he, and, with the modern encroachments of irrigation and agriculture, he will even mend a plowshare or make the

IN THE CAMARGUE THE FIGHTING BULL HAS HIS INNINGS

Between the sharp horns of the beast is fastened a bright cockade, which the young men seek to wrest away during the mad rush. Beyond a certain boundary, it is anybody's game, and the most bashful gardian may become famous overnight by securing the cockade of an especially famous bull.

irons for a rude cart. But it is the herder whom he really serves, and his fame stretches from the fortress-church of Les Saintes Maries de la Mer to the battlements of Aigues Mortes and the Roman arena at Nimes.

THE NACIOUN GARDIANO IS A COWBOYS' UNION

The "Nacioun Gardiano," a sort of cowboys' union, was organized to unite the lovers of the Camargue through pride of craft. In the Provencal festivals, it is the "Nacioun Gardiano" whose riders form parades and follow their leader, upon whose crimson banner are embroidered the golden cross of Languedoc and the mystic bark of the Holy Maries. From time to time these riders, some of them owners of vast herds, meet to play equestrian games.

The specific purpose of this group is the maintenance of the herdsmen's traditions, the perpetuation of the sports and customs of the past; but, above all, they foster the sweet speech of Provence and defend the traditions of the Camargue.

The righthand man of the gardian is the Camargue pony. Light gray in color and with a shaggy coat, the steed has a hang-dog air and an unkempt appearance. His low-hanging head, big and square, has sleepy eyes and a quiet expression. But never did a more disarming appearance camouflage a more satanic spirit. When mounted, this Rip Van Winkle among horses becomes spirited and full of the devil, half wild and with a savage temper.

THE CAMARGUE PONY HAS IRON ENDURANCE

Camargue horses are skittish and sly, and often they have a kick like the mule of Daudet's famous story, who treasured his animosity for seven years, and with one wallop transformed Tistet Vedene into a whirlwind of blond dust in which fluttered an ibis feather. They are seldom shod and live to a ripe old age. I have known good saddle-horses to be thirty years old.

Scientific men have searched in vain for an explanation of the origin of the

THE SPECTATORS FORM THE WALLS OF THE ARENA IN CAMARGUE BULL-FIGHTS

The mayor and the members of the city council of Le Cailar sit in a high gallery, but most of the spectators prefer ringside places. When the bull rushes his antagonists and charges toward the encircling crowds, it is a case of every man for himself.

Camargue pony. Some say he is descended from the Numidian horses brought over by the Roman cavalry; others ascribe his ancestry to the horses left in the Rhône delta by the Saracens. He resembles the long-haired horse of Tibet and the Siberian pony.

By a perfect adaptation to his environment, he has the same flat type of foot and hard hoof that distinguishes the horses of other marshy lands. He is bold, powerful, and sure of foot.

Rustic and sober in appearance, he has an iron endurance and is so self-reliant that he needs little care. When the rider dismounts after the day's work is done, the Camargue horse prefers to graze in freedom on the sparse moor rather than be well fed in a stable. The first time an outsider rides one he ascribes its ancestry to the hounds of hell. At the end of a month he feels like kissing his trustworthy little steed each time he parts from him.

Before the advent of the modern threshing-machine, the horses which run wild through the barren stretches of Camargue were employed to thresh wheat on the large farms of Provence and Languedoc. Sheaves were spread on the barn floor and the grain trodden out, as is still the custom in many parts of the world.

AMERICAN ARMY IN FRANCE USED CAMARGUE PONIES

Camargue horses are never employed in the French cavalry on account of their small size, but the American Expeditionary Force recognized their good qualities in war. When well broken and well trained, the Camargue horse is the cowboy's mainstay. He is the only mount with enough strength, suppleness, spirit, and stamina for rough riding on the barren ranges.

This independent little steed is not only a good worker, but, like his master, when a holiday comes, he delights in play. Trained as is a polo pony to take a full share in the sport, the Camargue cayuse measures up to the demands of the situation.

At *aiguillettes*, a contest in which the riders try to impale small wooden rings on their long wooden spears, the horse

A STATUE OF MIREILLE, HEROINE OF MISTRAL'S FAMOUS PROVENÇAL POEM

Although a purely imaginary creature, the central figure of *Mirèio* has had so great an influence on Camargue life that the town of Les Saintes Maries honors her with the same assumption of reality that Paris does Abelard and Heloise and Beaucaire does Aucassin and Nicolette. Around the statue is a railing in which the trident of the herdsman (page 15) figures.

shows a steadiness which is remarkable. In horse-racing he reveals unsuspected speed. But it is in the exciting game of *écharpes* that the Camargue pony revels.

Each of the two contending teams has six or eight riders, each wearing on the left arm three scarfs bearing the colors of his camp. The object is to tear the scarfs from one's opponent's arm before he can snatch yours. In the excitement of the match, the men center their attention on each other, and the ponies are depended upon to wheel and run to the best advantage. Often they are reluctant to cease their milling when the game is won, but seldom is the most spirited pony known to kick or bite in order to gain advantage.

"PUSS IN THE CORNER" ON HORSEBACK

Épervier is a glorified form of "Puss in the corner," played on horseback; and here, too, the ponies show an uncanny intelligence in dashing for the unoccupied spot at the blast of the bugle, and on finding another seeking the same base, outrunning him, or wheeling at full speed to occupy another position.

So spectacular are these equestrian sports that the ancient arenas of Arles and Nimes today resound to the applause of the modern Provençals as they did eighteen centuries ago to the cheers of the provincials of Rome.

In these ancient amphitheaters, built by imperial Rome to spread content among a conquered people, Provençal games proclaim the fact that the joining of Provence and northern France was a union of equal with equal, rather than the cultural domination of one people by superiors.

CAMARGUE CATTLE ARE OF ASIATIC ORIGIN

Just as the shaggy horse of Camargue lacks the thoroughbred look, so the bulls lack the four-square beefiness for which a packer pays top prices. These cattle are of Asiatic origin, trained for speed rather than weight, and can outrun many horses. When gathered in herds they

are tractable, but when segregated they are hard to control.

Small in size because of the sparse pasturage, the Camargue bull's coat is black, with occasional reddish-brown tints. He has the face of a philosopher, thin and full of expression, with bright eyes. His horns are long and sharp, so mounted on his small head as to resemble a lyre without strings.

Formerly some of these rangy beasts were broken to the plow, but they do not fit the rôle of dumb, driven cattle, and their flesh is so tough and has so gamy a flavor that they are seldom killed for food. Nowadays they are only used for the Provençal mode of bull-fighting, of which the people are so fond.

In some parts of Camargue cattle-breeders cross the native stock with Andalusian fighting bulls. These cross-bred animals are used in the *corridas del muerte*, bull-fights of the Spanish type, which are given each year in the principal towns of the south of France. But the Camargue herdsman has his own excitement connected with his work as breeder and trainer of fighting stock.

MAIN STREET, LES SAINTES MARIES DE LA MER

It is paved with slippery granite and echoes all day long to the sound of wooden sabots.

A frequent pastoral task is that of cutting out a particular animal from the herd, changing a cow from one grazing place to another, separating a calf from its mother, or choosing the bulls for the next fight.

The *manado*, or herd, is surrounded and some riders circle it to keep it compact. Then the owner, followed by his herders, enters the group slowly, in order not to frighten the cattle.

First the leader-bull is cut out. That animal is usually of native stock, more obedient than the rest, partly tame, and trained to direct the actions of the other wild bulls and rally them when disbanded. A bell hangs from his neck and his wide horns have been cut off. He bears a sonorous name, for very often the gardians call to him to remind him of his duty as a leader. Sometimes they emphasize the hint by a cut of the trident on the croup.

The cowboy pony, perfectly trained, understands which animal he must follow. Spurred to a run, the horse begins the exciting chase, plunging on in the bull tracks, trotting, wheeling, stopping short,

A LIGHTHOUSE ON THE MARSHES OF SOUTHERN CAMARGUE

and dashing off at top speed. When the bull, separated from the herd and kept at a safe distance, is left to his own devices he stops, snorting and tossing his head, and some rider looks after him.

More difficult is the sorting of the other wild, sly animals. Once outside the herd, they often make such terrific dashes that the gardian cannot outride them, in spite of the fleetness of his steed. The beasts which are chosen out of the manado follow the leader-bull, and the gardians surround and drive them whereever they will. One cannot easily realize the suppleness, the quick decision, and the fleetness of foot which the gardians require from their steeds in this every-day but exciting task.

THE BRANDING FESTIVAL

But it is above all in the *ferrade*, or branding, that the gardians and their mounts show their greatest skill and alertness. This operation is performed in the spring of each year and consists in marking the young stock. Formerly all the *manadiers*, or owners, used the branding-iron for searing their initials or heraldic mark on the left flank of the bulls. Nowadays most of the owners prefer *escoussura*—that is to say, to split the ear of the bull in a manner peculiar to that particular herd.

The round-up has become a great holiday gathering, to which the manadier invites his friends and neighbors. Early in the morning carriages arrive filled with Provençales in their picturesque costumes, and amateur horsemen, who, on their white horses, equipped *à la gardiane*, come to aid the gardians in their work.

A suitable ground has been chosen in advance, a large level space with no obstructions. Close by, the gardians have assembled the herd. The carriages are arranged in a vast semicircle, forming an impenetrable barrier, and in the foreground a groove marks the boundary where the horsemen must stop in their chase.

In front of the carriages, filled with spectators, men and young folk on foot await, their eyes fixed on the herd. Over there one sees a young bull picked out and chased by the horsemen. It has leaped over the boundary and now belongs to the crowd on foot, who will try to secure it by running it down.

More venturesome than the others, a young man defies the young bull, which

THE EDIBLE SNAIL FLOURISHES IN THE CAMARGUE

A favorite feature in the gastronomic romances of the French and Italians, the edible snail, tradition says, was introduced into Britain by the Romans. This species is herbivorous and a great enemy of the gardener, but in the wild Camargue is welcomed by the herdsmen, for whom the *Helix pomatia* furnishes many a meal. The hat furnishes the yardstick by which to measure the size of the shells.

charges, and in a cloud of dust the man is bull-dogging the beast. Although thrown by the animal, he has succeeded in encircling its neck, and, tightening his hold, he brings it to earth amidst tremendous applause. Held immovable, the bull is marked. Then it scrambles to its feet, bellows, and joins the lowing herd.

Each young bull goes through the process of being muzzled, an operation which consists of placing in its nose a slab of wood called *museau*, shaped like a half-moon. The animal is free to graze, but the muzzle, falling down on its nose, prevents it from sucking. In time this slab of wood decays and falls off.

"THE FIGHT FOR THE COCKADE"

From the natural pastoral drama, the fight between man and beast incidental to branding, was developed the Provençal "fight for the cockade." The origin of this contest antedates the oldest traditions. It gratifies the passion of the Provençal and the Languedocian peasant for this peculiarly humane type of bull-fighting.

The Provençal fight for the cockade has nothing in common with the Spanish fight to the death, which has been celebrated for eighty years, with ceremonial pomp, in the arenas of Nimes, Arles, Marseille, Beaucaire, and Lunel.

In the villages the fights are staged in temporary inclosures formed of carts, barrels, and boxes. Formerly the seven animals used for the day's sport were always driven in by gardians. Now it is only in Languedoc that this picturesque custom is kept up, for in Provence the animals are brought to their bovine Olympic in special wagons.

It is to Le Cailar, about 12 miles from Nimes, or to the neighboring villages, that one must go to see an *abrivado*, the rapid charge of the gardians, taking the bulls to the local fight.

At daybreak the crowd gathers in the fields to eat, dance, and be amused by the snorting of the bulls.

BLESSING THE SEA AT LES SAINTES MARIES DE LA MER

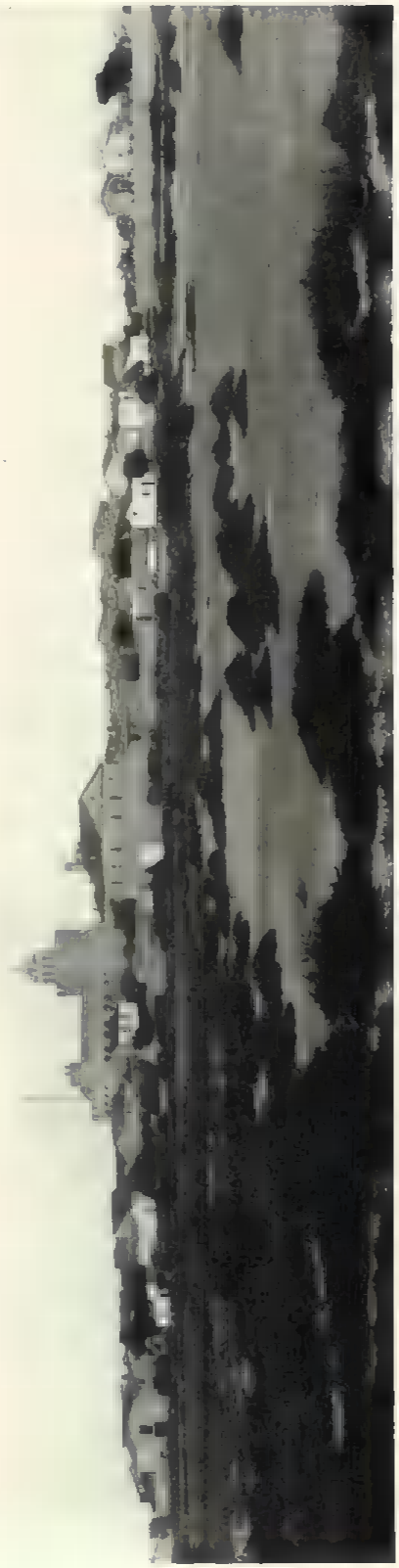
Twice a year, in May and October, the peasants of Provence come to Les Saintes Maries and march with banners to the lonely shore where the sea is blessed for having given the Holy Maries of Calvary to the Camargue (see text, page 33).

A GRANDMOTHER OF CAMARGUE

A high chignon, bound with black velvet and lightened with a touch of lace, forms the head-dress of the peasant women.

CONTENTMENT IN CAMARGUE

The farm laborer of this cattle country is an amiable citizen of few wants, and these easily satisfied.



WHERE TRADITION RAISED A VILLAGE ON THE SANDS

In former days the fortified cathedral at Saintes Maries de la Mer was the refuge of fisher folk when pirates descended upon the little town to pillage. An old document of 1323 says that at that time the cathedral was nearly two miles from the sea. Today it is only about 275 yards from the waters. In the churchyard are tying-posts for boats, which indicate that once the site was under water at times (see text, page 32).

Assisted by the gardians and amateur horsemen, the owner selects the bulls which are to make sport for the populace. Then, hedged in by the whole squadron of horsemen wearing gaily colored shirts, the animals go slowly toward the village. Behind them comes the long line of carriages filled with merry boys and girls.

THE DRIVE OF THE BULLS

At the outskirts of the village, groups of people, sticks in hand, wait, ready to spread disorder among the horsemen and give the frightened bulls a chance to escape. Their purpose is to stage an exciting spectacle and see the gardians chase the disbanded animals across the fields.

But the horsemen are on their guard. At a little distance from the entrance to the village, the white horses get closer to the bulls and all break into a gallop. Then, in a whirlwind of dust, amid cheers and vociferations, blows, shouts to the leader-bull, the thunderous orders of the manadier, and the whistling and applause of the crowd, a mad charge is made through the village street which leads to the *toril*, or stable, where the animals are to be confined.

Side by side ride the horsemen, hard pressed on both flanks, with stirrups interlocked. The horses, covered with sweat, resist with all their might the pressure of the mad bulls (see page 7).

In this charge, so full of rude sport, accidents often happen. Sometimes a half-wild horse takes fright at the shouting crowd and spreads disorder among his fellows. Another, though his hoofs are unshod, slips on the stones and takes his rider with him, or crushes a horseman against a wall.

It is an exciting game, full of unexpected incidents. Nothing stops the horsemen and horsewomen, who are always present in these wild rides through the gantlet of shouting people on foot.

The abrivado brings in sufficient bulls during the morning. The real sport takes place in the afternoon.

THE OBJECT OF THE CONTESTANTS IS TO SNATCH THE COCKADE

In a narrow stall, before the contest, a gardian attaches to the forelock of the beast a colored cockade poised between his deadly horns. It is this piece of ribbon that amateurs and professional gardians will endeavor to snatch off with the bare hands or with a steel hook shaped like a comb.

Each captured cockade brings with it a premium, a sum of money varying from a few francs to several hundred.

The arena is crowded with people; the spectators shout to one another, and in the heat of the afternoon the venders of oranges and refreshing drinks circulate among the people.

In the ring the cockade hunters wait, their eyes fixed on the gate of the toril. At a bugle call, it opens suddenly, allowing a black bull, blinded by the light, to enter. The bugle sounds a second time and the crier announces the prize which each cockade represents. Then the sport commences.

It is by the *raset* that the agile young man will endeavor to secure the cockade. This is a feint executed in front of the animal, on the flank, or behind him. Those employing this method are called *rasetaires*.

While the attention of the bull is elsewhere directed, the rasetaire advances in a wide circle. When a few yards from the animal, he attracts the animal's attention by shouting, and while the beast charges him, the man quickly thrusts his hand between the horns, endeavoring to detach the cockade with a quick upward motion. Then the man, successful or not, and followed by the bull, rushes to the barricade.

In order to execute this feint, one must have a sure eye, quick decision, and great agility. The slightest fault or hesitation may bring a wound to the rasetaire, some of whom are tossed on the horns of the bulls during these encounters.

The premiums attached to the cockades vary according to the qualities and savagery of the fighting bulls who are defending the ribbons.

These *cocardiers* should be valiant bulls, full of speed and tenacious in their pursuit of their adversary. They are especially trained for this purpose.

When a bull has finished its fight the leader-bull is sent into the ring to conduct it off to the stable.

Sometimes, to increase the excitement of the bull-fight, gardians arrange *l'esperage*, which consists of resisting with a trident the mad onslaught of a bull. Walking shoulder to shoulder, their tridents held firmly before them, two gardians advance across the arena. When the bull charges they must resist his assault unflinchingly by goading the beast on the muzzle.

Now the bull-fight is over and the bulls are waiting in the dark toril, some with the cockade intact between their dangerous horns.

The gardians are already mounted. Quickly the gate of the toril is opened. With rattling horns, the bulls bound behind the riders, while the people shout and yell. Spurring their steeds into a run, the gardians direct the mad rush of the beasts.

Now the village is far away, and the shouts and yells of the holiday crowds die away in the distance. In the darkness of advancing night the white steeds of the gardians have no need to direct the now quiet beasts to their grazing place. The last cultivated fields have been passed, and beyond the line of the silver-leafed willows, behind the mirror of a marsh, the herd is at home once more.

COW FIGHTS AT NIGHT FOLLOW THE DAY'S SPORT

Every day during the festival period it is the same. The herdsmen are on horseback a great part of the day to select and assemble and bring back the fighting cattle. In Languedoc, for instance, some villages have ten bull-fights on the festival of the local patron saint, and often people organize nightly fights with cows, which are very funny and not so dangerous.

"Bulls, bulls! Here come the bulls!"

Magic words, which make the Provençal people come running. Bull-fight and horse-play constitute the favorite games of the little boy when released from the school-room.

AN ORNATE SUCCESSOR TO THE HOMELY MAS, OR FARMHOUSE, OF CAMARGUE

Here formal gardens and a palatial dwelling have taken the place of the humble home of the Camargue peasant. In such a château every modern convenience is to be found, even an electric wine-press.

In the villages the cattle-owners and champion herdsmen are known by their Christian names and nicknames. The people cheer them and are proud and happy to be acquainted with them. These riders are kings of the country, for they bring happiness to all.

ARLESIAN WOMEN ARE NOTED BEAUTIES

Arlesian women have a reputation in the Midi as perfect beauties of the Greek type, descendants of the colonists who came hither in ancient times, and fit rivals of the lovely ladies of Georgia and Kashmir, with the same classic nose and fine features. Some of them have a Saracenic aspect, with olive complexions and long, dark, Arabic eyes.

But even their harmonious beauty is enhanced by the graceful old-fashioned Arlesian dress they wear. That costume, in the style of 1830, is still worn, in spite of "ready-mades" and Parisian fashions.

When fourteen years old the *chato*, or young Provençal girl, begins to dress her hair in the Provençal fashion and to wear the coveted styles of Arles. This day of costuming is a great holiday in the home. The girl dresses her hair in a high chignon, and around it she arranges a piece of fine old lace, tied with a black velvet ribbon, fluttering behind.

If the headdress is the most important article of the Arlesian toilet, the next is the white *capello*, a pleated muslin shawl, crossed over "her rounded bosom like a double peach, not ripe as yet."

Over that shawl she wears another, of printed calico, of the same color as the long, trailing gown. A long-sleeved bodice of black satin sets off the bright colors of the shawl and gown.

With Arlesian dress some jewelry is quite necessary. A long gold pin secures the velvet head-ribbon, a rich brooch closes the capello and heavy golden bracelets adorn the firm brown arms.

Ancient jewels are scarce and have been replaced by modern pieces, suggested by Provençal flowers and animals or by neo-Provençal literature. A trinket frequently seen is a locust, the symbol of Provençal poetry. Another is the seven-rayed golden star, the mark of the Féli-

bres, Mistral's colleagues in literature.

So attired in their Provençal costumes, the girls of the Camargue go to the festivals over the wide salt moor, mounted like fair Ellens on the strong white steeds of their brave Lochinvars.

MISTRAL SAVED THE OLD COSTUME

A quarter of a century ago, the fair Arlesiennes, fearing humiliation if they failed to follow the style dictates of Paris, gradually began to discard the far more lovely peasant dress. Mistral, who loved fine costumes as he did the muse, sought to retain for the Camargue the graceful dress of olden time. In 1903, just before he brought added fame to his beloved land by winning the Nobel prize in literature, the poet of Provence made a speech in which he felicitated the girls upon the beauty of their dress and begged them to perpetuate forever such a charming habit.

THE GAME-KEEPER OF A CAMARGUE ESTATE

The great brass plate on this keeper's breast advertises him to be "the law" and the keeper for M. Vitou's Mas de Pebre.

So was the *Festo Vierginenco*, or young girls' festival, established. In 1904 the same ceremony took place at a great popular meeting in the splendid ruins of the ancient Roman theater of Arles.

On a glorious Easter Monday there was a great parade of young Provençal girls in full dress, and the people were most enthusiastic over those who came from their moorland homes riding on horseback behind their knights of swamp and sage. It was a triumphal exhibition. The Arlesian people roundly praised the graceful procession of Provençal beauties and the return of the traditional costume. In 1899 Mistral created in the town of Arles a Provençal museum, called the Museon Arlaten. With the proceeds of the prize which *Mirèio* won for him, he added to the collection in the museum of Arles.

Here has been gathered an almost priceless exhibit of Provençal peasant art. There is also an important collection of old Provençal furniture, which is at once beautiful and perfectly adapted to the people's simple needs. One sees large cupboards and wardrobes made of carved oak, with high iron hinges, and the familiar decorated kneading-board and long-case clock.

WINDING HORSEHAIR TO MAKE THE SEDEN

The man is pulling out an even strand of horsehair from the bundle under his left arm. Some distance away to his right there is a spindle like that which rests against the box and which twists the even strand of hair into a small rope. This is in turn twisted with others to form the lariat of the gardian (see text, page 15).

Rooms have been arranged to represent in detail the life of Provence. One shows a traditional Christmas dinner in a gentleman farmer's living-room. Here has been gathered the ancient rustic earthernware, baskets such as Vincèn and his father wove, and everything typical of the rural life of Provence.

A special room is devoted to the cowboy life in Camargue. It is decorated with the homely objects and implements of the pastoral life.

Proud as the people are of their finery, there is nothing effeminate about the Camargue. Courage and chivalry are native to the soil.

THE LANDING OF THE HOLY MARIES OF THE SEA

Home of supple cowboys, whose feats of daring rival those of the toreador of Spain or neighboring Nimes, Camargue's wider reputation rests upon a religious legend, whose holy personages saved the sand-dunes from oblivion and gave them a lasting merit as the landing place of the Holy Maries of the Sea, exiled from the Holy Land to unfamiliar scenes, upon which, when they died, the mantle of their holiness fell; so that to this day the lame walk and the sick are healed through pilgrimage to their shrine.

On a spit of land so low that in the churchyard there are tying-posts for boats like those beside the Grand Canal at Venice, there stands the fortress-church to which *ex voto* offerings have come from kings and fishermen. Just beyond, spearing the sky with towers which make the ancient steepled roofs seem low, rise the standards of wireless aërials.

Among the marshes and the vast wastes of salt moor, where only saltwort grows, lies this little fishing village of Saintes Maries de la Mer. Its red-tiled cottages border the blue Mediterranean and nestle against the fortified walls of the cathedral.

Saintes Maries de la Mer, or "Li Santo," as the people often call it, is the lodestone that attracts each year many pilgrims from Provence and Languedoc. A legend told in this quaint village relates

PLAYING BESIDE THE PLYMOUTH ROCK OF CAMARGUE

In the Place Mistral, in Les Saintes Maries de la Mer, there is an antique cross which commemorates the landing of the mystic pilgrims who came hither from Calvary (see text, page 32).

that after the death of Christ the Jews seized Lazarus, Mary Magdalene, Mary Jacobee, the mother of St. James the Less, and Mary Salome, the mother of James and John. They were left in the care of an Egyptian servant and cast adrift in a disabled boat, from which they were shipwrecked on the sands of Camargue.

The spot at which the holy women landed became the site of the village of Les Saintes Maries, and it is said that they proceeded from this place to evangelize the southern part of Gaul, whence they eventually returned to die.

AN UNKNOWN PRINCE BUILT THE FORTIFIED CATHEDRAL

Many years later an unknown prince built on the same spot a fortified cathedral in honor of the sacred visitation and provided therein a receptacle for the safe keeping of the sacred relics. This cathedral was the scene of many fierce attacks during the invasion of Gaul by the Saracens.

At the time of the annual pilgrimage the reliquaries, which have been kept in the high chapel above the church floor, are lowered to the chancel. The following day, along the beach, a procession may be seen with pilgrims bearing at its head a flowered stretcher on which rests a miniature boat containing statues of the three Marys. Then from a fishing-boat the priest blesses the blue sea which gave them to Camargue.

THE MYSTERIOUS GITANOS ARRIVE IN MAY

In the month of May one meets at Saintes Maries de la Mer nomad tribes, often erroneously called Bohemians. In Austria they are called Tziganes; in Germany, Zigeunern; in Italy, Zingari; in England, Gypsies; in Spain, Gitanos; in the south of France, Caraques or Carai. They call themselves the Gitanos and speak a language crammed with strange words which are not connected with any other known tongue. They have nothing in common with ordinary tramps.

The Gitanos are tall and broad-shouldered, with sunburnt complexions, curly hair, and soft black eyes. The women

have a wild beauty and are very jealous of their genealogy. They marry only among their own people.

These nomad tribes live away from civilization, always wandering, proud and free. They never settle down and their house is the moving "roulotte." Horse-dealing is their usual vocation, and they are excellent judges of horseflesh.

At least once in their lifetime these raggle-taggle Gypsies, scattered all over Europe, proceed toward this wild section of France to worship a Christian saint, their patron, Saint Sara, the Egyptian.

The Gitanos take no interest in the Christian ceremonies. During the pilgrimage they remain in the crypt of the church, which is specially reserved for them. There they sit, holding huge wax tapers in their hands, worshiping and singing. No stranger is allowed to be present at their mysterious ceremonies, which are followed by the coronation of the Gypsy king and queen.

On the 25th of May in the pilgrim procession, the Gitanos are accustomed to carry on their shoulders a little flowered boat containing the wooden statue of Saint Sara, which they crown on the sandy beach, shouting "Vive, Sainte Sara"!

Then these nomad tribes leave, to resume their lonely wanderings.

THEIR ORIGIN IS A FASCINATING MYSTERY

The mysterious origin of this people has ever been a fascinating problem and has also been the favorite study of many scientists and writers, but unfortunately not all the explanatory theories propounded are substantiated by scientific data.

Some say the Gitanos may be the last survivors of a forgotten Egyptian or Assyrian civilization. Others, struck by certain similarities which they have in common with the Basque people, think they were the first Iberians. Others attribute to them an Indian origin, picture them driven westward by Oriental irruptions and identify the Gitan language with that of an Indian tribe of Sindh.

But the boldest and most curious theory is one which has been advanced after careful consideration and numerous observations of their customs, language, and ethnical characteristics.

According to Gitan legends and traditions that have been handed down from father to son and from tribe to tribe, there was a large land without a shore which was inhabited ages ago by the first Gitan people, but which disappeared one day in an overwhelming disaster.

Are these legendary lands the lost Atlantis? And did any of its inhabitants outlive the cataclysm? Was this fabulous country the birthplace of the first Basques, Gitans, and American Indians?

Marquis de Baroncelli, who has long studied the vexing question, has noted the strange likeness of the ethnical characteristics of the Red Skin and the Gitan. He has also been much surprised by some customs common to both races, such as the simple action of inspecting the teeth of a horse.

He noticed the curious answers to the question, "Whence did your people come?"

"From where the sun rises," says the Indian. "From the sunset land," say the Gitanos.

These speculations are strengthened by sayings of Gitanos who take part in the pilgrimage to "Li Santo."

A snowy-bearded Gypsy patriarch said: "We are to the human race what the Camargue horse is to his—the sole survivors of a vanished world."

ON APRIL 26, MR. A. W. CUTLER, of Rose Hill House, Worcester, England, died in Cava dei Tirreni, southern Italy, while making for the NATIONAL GEOGRAPHIC MAGAZINE a photographic survey of the scenery and peasant types of Calabria. Many of Mr. Cutler's superb photographic studies have appeared in THE GEOGRAPHIC during the last nine years, and only a few months ago he completed for it a remarkable collection of pictures in Portugal. He had expected to make similar photographic series in Greece, Morocco, and Japan upon the conclusion of his labors in Italy. The members of the National Geographic Society will learn with profound appreciation that this gifted photographic artist has left as a bequest to The Society his entire collection of negatives, the result of a life work in many parts of the world—a truly notable gift toward the humanizing of geography.

MIDSUMMER WILD FLOWERS

IN THE following pages THE GEOGRAPHIC offers another series of biographies and exquisite illustrations in their natural colors of some of the familiar wild flowers of America.

The several series published previously have included "American Wild Flowers," with twenty-nine biographies and illustrations in color, in May, 1915; "Common American Wild Flowers," with seventeen biographies and illustrations in color, in June, 1916; "Our State Flowers: Floral Emblems Chosen by the Commonwealths," with thirty biographies and illustrations in color, in June, 1917; "American Berries of Hill, Dale, and Wayside," with twenty-eight biographies and illustrations in color, in February, 1919; and "Familiar Grasses and Their Flowers," with eight biographies and illustrations in color, in June, 1921.

Most of the thirty-eight species of flowers illustrated in the accompanying series will be found in bloom throughout the United States during July and August. Their beauty will command the admiration of passers-by, while the variations in their structure and the provisions which Nature has made for their propagation will accentuate anew for the student Wordsworth's famous aphorism in tribute to "the meanest flower that blows."

NATURE PROTECTS HER OWN

In one of the earlier flower series the Editor emphasized the danger of exterminating some of our wild flowers by indiscriminate gathering. Happily, Nature has made such ample provision for the reproduction of the flowers discussed in this series that only five of the number require protection—the Bluebell (Plate XIV), the Rosemallow (Plate VIII), the Sheep Laurel (Plate VII), the Fringed Orchid and the Water Avens (Plate VI), and Spiderwort or Widow's Tears (Plate IV). All the others may be gathered whenever and wherever found without danger of robbing future generations of their loveliness.

These beautiful illustrations, costing $25,000, are reproductions from paintings made by the gifted artist-naturalist, Miss Mary E. Eaton, of the New York Botanical Gardens, who has preserved to a remarkable degree the color, form, and grace of the specimens here presented.

Additional flower series are in preparation and will be published in THE GEOGRAPHIC subsequently.

It will be noticed that in some cases the names of plants in the text do not exactly agree with those on the plates. This is due to the fact that the text material could be prepared after the adoption of the Official Catalogue of Standardized Plant Names, a monumental work compiled by the American Committee on Horticultural Nomenclature, designed as a sane and workable harmonization of the present confusion in every-day plant names. The plates had to be sent to press before this standardized nomenclature was adopted. In the cases where changes have been made both the new and old designations are given in the text.

AMERICAN WATERLILY

Castalia odorata (Dryand.) W. & W.
[Plate I]

This beautiful inhabitant of ponds and streams belongs to a family of water-loving plants famous in many parts of the world. It is a cousin of the lotus of Egypt and of the sacred lotus of India. Also it claims relationship with the gigantic *Victoria regia*, the queen of floral aquatics, whose leaves are often seven feet in diameter and whose flowers are frequently fifty inches in circumference.

The range of this fragrant species is from Nova Scotia to the Gulf of Mexico and from the Atlantic Ocean to the Mississippi River. Its preferred habitat is still water, such as ponds, shallow lakes, and slow streams. It begins flowering in June and continues to put forth blossoms until touched by frost.

Its leaves, dark green above, pinkish on the under side, and somewhat heart-shaped, float on the water. The solitary flower, pure white or pink tinged, deliciously fragrant, and often five inches in diameter, opens shortly after sunrise, spreading a bounteous feast for bees, flower-flies, beetles, and "skippers."

This blossom affords a striking picture of one phase of plant evolution. As the ages passed, the waterlily found what most business houses learn sooner or later, that it pays to advertise. What good were its numerous pollen-producing stamens if the insect buyers failed to come and carry away the pollen to fertilize other flowers? Therefore many of the stamens were gradually transformed into petals, through natural processes, with the result that now, having intelligence of its wares published to the four winds, no pollen-dispensing establishment is busier than the American waterlily when the insect hosts are a-wing.

The stamens and pistils of the scented water-lily mature at different times, thus insuring cross-fertilization.

SHEEP SORREL

Rumex acetosella L. [Plate II, left]

The sheep sorrel is another of the plant world immigrants to America that deserves deportation as an undesirable alien; but, like the English sparrows of the feathery kingdom, it fights its way into every community by its fecundity. Rivers, mountains, quarantines, every barrier that nature or man has set up against it, has been overridden. Even the Rockies, which have stood as a wall of adamant against the serried hosts of most westward-bound floral invasions, have been too low to keep the sheep sorrel in check; so that it is found from ocean to ocean and from Canada to Mexico.

The plant by some is known as field sorrel and by others as sour grass. It invades hay and pasture fields and crowds out the valuable grasses. Likewise, it disputes with the new-sown winter wheat for control of ground on which it has secured a foothold. Only the most persistent harrowing of the ground before seeding time will hold it in check until the wheat can come up and grow strong enough for the fray with the hardy foe.

The sheep sorrel is a member of the buckwheat family. Among its cousins are the buckwheats, the docks, the knot-weeds, the smartweeds and the tear-thumbs. It grows from six to twelve inches tall and when mature gives the field which it has colonized a real sorrel-top appearance.

ENGLISH PLANTAIN

Plantago lanceolata L. [Plate II, right]

Like the charlock, corn cockle, and the sheep sorrel, the English plantain is an alien which came to our shores as a stowaway and has made America its own. It has sundry names in divers localities, such as ribgrass, narrow plantain, and ripple-grass. It blossoms from June to September and fights stubbornly for position in both field and lawn. Its seeds mature about the same time as clover seed, and it is indeed a "tare among the wheat" when the farmer wants to sow his clover.

The English plantain places its homely cone of greenish buds on a tall grooved stem. These buds mature as brownish flowers, so minute as to be almost indistinguishable. The ones at the bottom open first, and then the procession moves up the cone, day by day, until each row of flowers has taken its turn at blooming. These flowers possess long-extending anthers mounted on filamentous stamens, and they float around the cone as the rings of Saturn around the planet. In the illustration one may see the cones at the various stages.

BLUE VERVAIN

Verbena hastata L. [Plate III, left]

Growing from four to six feet tall, with its flowering spikes branching upward like the arms of a candelabra, the blue vervain, whose flowers are more purple and violet than blue, possesses a range as wide as any other plant species in America, almost the entire United States and Canada being home soil to it. Wild hyssop and simpler's joy are other names for it.

One always regrets that *Verbena hastata* has a way of maturing the blossoms on each spike a few at a time instead of all at once, for seeds at the bottom of the spike, flowers in the middle, and buds at the top do not produce the pretty effect that a spike full of flowers would. The late John Burroughs, who could always be relied on to find beauty in any flower that possessed a trace of it, wrote of its drooping knotty threads as making "pretty etching upon the winter snow."

The blue vervain is a favorite with the bumblebees, which, with many other members of the bee family and the bee-like fly species, gather at its festal board.

It borrowed its name, simpler's joy, from a European sister, and has also appropriated many of the latter's traditions and much of its folklore. No plant that the herb-gatherer could find was more salable than the vervain; hence none brought so much joy to the simple peasant.

The vervain is known abroad as the holy herb, and was one of the plants sacred to the Druids of England. Likewise, it was held sacred to Thor, the God of Thunder, and was supposed to exert a peculiar influence upon the eyesight. It is said to have been found growing on Mt. Calvary, and is reputed, in the folklore of Europe, to stimulate affection and to be able to break the power of witches.

PICKERELWEED

Pontederia cordata L. [Plate III, right]

The pickerelweed is one of the members of the plant kingdom that insists upon making its home in the water, usually preferring the shallow waters of a stagnant pond.

It is a tall plant, with one blunt, arrow-head-shaped leaf, varying to a very elongated triangle. Above this leaf rises a spike about four inches long, from which issue numerous more or less irregular ephemeral, violet-blue flowers, each marked with a distinct yellow-green spot.

That ever-delightful biographer of the folk of Nature's garden, Neltje Blanchan, called the pickerelweed a vigorous wader, a sort of floral crane, and reminds us that in the backwoods people think that this plant is the favored resort of the pickerel when she deposits her eggs.

A botanist who made a careful study of *Pontederia cordata* says that its flowers occur in three forms, not on the same, but on different plants, excelling even the purple loosestrife in the striking type of its dimorphism.

Unable to set seed without insect aid, they resort to what seems little short of marvelous tactics to get the maximum benefit out of the visits of their winged guests. In one type of flower the stigma is raised on a long style to the very top of the blossom; in the second type the stigma comes half way up the flower cup; in the third type it remains at the bottom,

SWEET-SCENTED WHITE WATER LILY
Castalia odorata (*Ait.*)
Water Lily Family

Sheep Sorrel
Sour Grass
Rumex acetosella (*L.*)
Buckwheat Family

English Plantain
Rib Grass Narrow Plantain
Ripple Grass
Plantago lanceolata (*L.*)
Plantain Family

BLUE VERVAIN
Simpler's Joy Holy Herb
Wild Hyssop
Verbena hastata (*L.*)
Vervain Family

PICKEREL-WEED
Pontederia cordata (*L.*)
Pickerel-Weed Family

Bottle or Closed Gentian
Gentiana andrewsii (*Griseb.*)
Gentian Family

Larger or Hyssop Skullcap
Scutellaria integrifolia (*L.*)
Mint Family

Spiderwort
Widow's or Job's Tears
Tradescantia virginiana (*L.*)
Spiderwort Family

Golden St. John's-Wort
Hypericum aureum (*Bartr.*)
St. John's-Wort Family

Prickly Poppy
Argemone mexicana (*L.*)
Poppy Family

YELLOW FRINGED ORCHIS
Habenaria ciliaris (L.) R. Br.
Orchis Family

STIFF YELLOW FLAX
Linum medium (Planch.) Britton
Flax Family

PURPLE OR WATER AVENS
Geum rivale (L.)
Rose Family

Corn Cockle
Agrostemma githago (*L.*)
Pink Family

Sheep Laurel or Lambkill
Kalmai angustifolia (*L.*)
Heath Family

Blazing Star
Colic Root Rattlesnake Master
Gay Feather Button Snakeroot
Liatris squarrosa (*Willd.*)
Composite Family

PURPLE BERGAMOT
Monarda media (*Willd.*)
Mint Family

HAIRY BEARD TONGUE
Pentstemon hirsutus (*L.*) *Willd.*
Figwort Family

CRIMSON-EYED ROSE-MALLOW
Hibiscus oculiroseus (*Britton.*)
Mallow Family

Beach Pea
Everlasting Pea
Lathyrus maritimus (*L.*) *Bigel.*
Pulse Family

Common Milkweed
Asclepias syriaca (*L.*)
Milkweed Family

Sweet Scented Shrub
Calycanthus floridus (*L.*)
Calycanthus Family

Pokeweed
Phytolacca decandra (*L.*)
Pokeweed Family

CLAMMY GROUND CHERRY
Physalis heterophylla (*Nees.*)
Nightshade Family

CHARLOCK OR FIELD MUSTARD
Brassica arvensis (*L.*) *Ktze.*
Mustard Family

Mist-Flower
Eupatorium coelestinum (*L.*)
Composite Family

Pink Corydalis
Capnoides sempervirens (*L.*) *Pers.*
Fumitory Family

New York Aster
Willow-Leaved Aster
Aster novi-belgii (*L.*)
Composite Family

TURTLE-HEAD

Snake Head
Shell Flower
Cod Head
Balmony

Chelone glabra (*L.*)

Figwort Family

TEASEL

Dipsacus sylvestris (*Huds.*)

Teasel Family

VENUS'S LOOKING-GLASS
Specularia perfoliata (*L.*) *A. DC.*
Bluebell Family

FERNLEAF FALSE FOXGLOVE
Aureolaria pedicularia (*L.*) *Raf.*
Figwort Family

BLUEBELL
Harebell Ladies' Thimble
Witch's Thimble
Campanula rotundifolia (*L.*)
Bluebell Family

Tansy or Bitter Button
Tanacetum vulgare (*L.*)
Composite Family

Eastern Silvery Aster
Aster concolor (*L.*)
Composite Family

Early Goldenrod
Solidago juncea (*Ait.*)
Composite Family

ORANGE MILKWORT
Wild Bachelor's Button
Polygala lutea (*L.*)
Milkwort Family

COMMON DODDER
Love Vine Angel's Hair
Cuscuta gronovii (*Willd.*)
Convolvulus Family

Each flower has two sets of stamens, and the length of these is always adjusted to the height of the pistil.

Whenever the pistil is high the stamens keep out of its way by occupying the lower and middle position. If the pistil is low they occupy the middle and high positions. When it is medium they occupy the low and high positions.

The result is that when the bee comes to gather nectar he gets his abdomen dusted with the pollen of the long stamens, his chest with that of the middle ones, and his head with that of the short ones. In this way he always carries the short stamens' pollen to the low pistils of other flowers, the long stamens' pollen to the high pistils, etc. This is necessary to cross fertilization. Darwin proved that only the long stamens' pollen would fertilize the high pistils, etc.

The pickerelweed's range covers the eastern half of the United States and Canada and its flowering season is from June to October.

CLOSED OR BOTTLE GENTIAN

Gentiana andrewsii Griseb. [Plate IV, left]

This member of the gentian family is the commonest of all its tribe in the East. It is remarkable for its tight-closed, bottle-shaped flowers of a blue that approaches ultramarine in intensity. Thoreau spoke of its "transcendent blue, light in the shade and turning purple with age." Occasionally some degenerate plant raises a crop of white flowers.

There is, perhaps, no other plant better fitted for late appearance than the closed gentian. It blooms only a few weeks ahead of Jack Frost, when short days and chilly nights discourage most of the flowers, and the deep-tinted blossoms hold themselves firmly closed, as though to protect the delicate stamens and pistils of its reproductive system from the sharp touches of the late year.

The bumblebee knows that the closed gentian has prepared a feast for his special delectation. This is a cup of nectar denied to the rabble by the flower's tightly closed doors and supplied to the bumblebee, which forces its way into the closed corolla. The flower dusts the bee with pollen while it sits at her table, and the insect carries this to its next host.

The favored haunts of the closed gentian are along the edges of rich woodlands, and its range is from Maine to South Dakota and from Georgia to Missouri.

HYSSOP SKULLCAP

Scutellaria integrifolia L. [Plate IV, middle]

Belonging to the versatile mint family, which includes such diverse denizens of field and forest as blue curls, wood sage, horse balm, bugleweed, horehound, pennyroyal, wild bergamot, gill-over-the-ground, self-heal, false dragon head, and catnip, the hyssop skullcap is at once beautiful and unpretentious.

Blooming from May to August over a range that reaches from southern New England to eastern Texas, this species of skullcap seldom grows taller than two feet, with the result that its fine colors are often hidden by surrounding vegetation. The leaves, like the stem, are covered with fine down. Its bright blue flowers are about an inch long.

VIRGINIA SPIDERWORT

Tradescantia virginiana L. [Plate IV, right]

The spiderwort, which is a cousin of the wandering jew and the Virginia day-flower, rejoices in the lacrymose every-day name of widow's tears.

Like its cousin, the day-flower, the spiderwort opens for only a brief time—the morning hours. Then the flowers are bright and lively enough for any company, but as the sun sweeps down the westward sky the petals begin to retreat into the calyx, and presently there is a thin jelly where a while ago was a flower. "Dissolved in tears," one might say, was the fate of the morning's blue petals surrounding the golden anthers.

The spiderwort is cross-fertilized by the bumblebees, which are attracted by an abundance of pollen. Bumblebees seem to be attracted by blue and purplish flowers as strongly as bargain-hunters are drawn to the red trimmings of ten-cent stores.

The botanical name of the spiderwort is in memory of John Tradescant, gardener to Charles I. A relative sent him some spiderwort seeds which he planted at Hampton Court. Since that time the Virginia spiderwort has been a well-known garden flower in England.

The range of the spiderwort extends from Maine to South Carolina and westward to the Rocky Mountains. Its habitat is rich, moist ground.

GOLDEN ST. JOHN'S-WORT

Hypericum aureum Bartr. [Plate V, left]

The St. John's-wort family is small, being made up of shrubs and herbs ranging from St. Andrew's Cross to orange-grass.

There is no member of the family with a better claim to beauty than the subject of this sketch. With its drooping petals, its host of stamens, and its united pistils, the blossom of the golden St. John's-wort is admittedly a beautiful flower. It flourishes in the Southern and Western States.

The plant is a shrub that attains a height of three feet, more woody than most species of St. John's-wort, and often appearing of globular shape, like a miniature tree. It has a red bark that gradually cleaves off in thin layers. Wild, it prefers rocky situations and shady spots where moisture is longest retained. Cultivated, it grows from cuttings or from seeds, the seed-grown ones blooming the second year.

PRICKLEPOPPY

Argemone mexicana L. [Plate V, right]

This thorny terror of the barefoot boy is an immigrant from Mexico, but it makes itself thoroughly at home as far north as New Eng-

land. It was brought to the United States as a flower, but promptly broke out of captivity and since has been rated as an escape. It prefers to share the haunts of men, and roadsides, old orchards, and meadows that have not been touched by the plow for a long time are its favorite habitats. Its prickly leaves are as sharp-pointed as needles and its stem is covered with "stickers."

The flowers are usually two inches broad or more, with four to six yellow petals and numerous golden stamens. Like other poppies, *Argemone* has no nectar to offer the bees, but it does have plenty of pollen to give them, and they come to it in large numbers. Cross-fertilization is accomplished with the help of the insect visitors. The fruit capsules are nearly an inch long and are well armed with spines.

The pricklepoppy has many interesting relatives, among them the bloodroot and the celandine.

YELLOW FRINGED ORCHID

Habenaria ciliaris (L.) R. Br. [Plate VI, left]

Cousin of the ladyslipper, the moccasin-flowers, the ladies-tresses, the rattlesnake plantains, the twayblades, and the puttyroots, the yellow fringed orchid belongs to a family that has some six thousand different species grouped in about four hundred genera. Not even the grasses can boast of a greater family tree than this.

This orchid, a perennial, has an ingenious mechanical device to insure cross-fertilization. Its nectar is concealed in a tube so narrow and deep that only the long-tongued butterflies and moths and persistent bumblebees can reach it. There is but one stamen. Just above the stigma there are two pollen clusters, each composed of several small packets of pollen tied together with an elastic thread. At the end of these threads is a sticky disk. This disk adheres to the head of the nectar-sipper and is carried to the next flower visited. Here, in turn, the pollen packets come into contact with the sticky substance of the stigma and fertilization takes place.

Orchids are among our most progressive flowers, having risen to that stage of development where self-fertilization is quite impossible. Indeed, some are so sterile to their own pollen that when it is placed directly upon the stigmas no seeds are set.

But if the orchids depend upon the insects to carry their pollen to one another, these winged messengers measure up fully to the trust reposed in them. By actual count one orchid was found to bear more than a million seeds. Fortunately, only a small portion of these ever grow into other plants. If all of them did, the whole earth would soon wear an unbroken covering of orchids.

The yellow fringed orchid is an elegant and stately flower. It ranges from Vermont and Ontario to Florida and Texas and prefers wet meadows and sandy bogs, where it grows from one to two feet tall. It blossoms during July and August.

BROOM OR STIFF YELLOW FLAX

Linum medium (Planch.) Britton [Plate VI, middle]

No claims to superior beauty can be made on behalf of the subject of this sketch, for, stiff-stemmed, close-leaved, and small-flowered, it is neither graceful nor gorgeous.

The professional botanist tells us that "its leaves are acute, erect, or ascending; pedicels short; inner sepals commonly erose or somewhat glandular-ciliolate." Which means, in every-day words, that the leaves are sharp-pointed and grow upward, hugging the stalk; that the little stems on which the flowers grow are short; that the outer coverings of the buds have a gnawed and hairy appearance at the edges.

This plant is a cousin of *Linum usitatissimum*, which has given the world its linen from time immemorial. The days are gone when every American farmer raised some flax and when the women folk had to use their spare time, after cooking, tending the garden, feeding the chickens, dressing the children, cleaning the house, etc., in spinning and weaving, and with their passing the flax family has had to shift for itself.

The range of the broom flax extends from Vermont and Ontario southward. It prefers a dry or sandy soil. The honeybee is its principal pollen-carrier.

PURPLE OR WATER AVENS

Geum rivale L. [Plate VI, right]

This graceful plant, with its nodding, bell-shaped blossoms, belongs to the rose family, which is distinguished for the diversity of forms assumed by its members. It is a cousin of the ninebark, the meadow-sweet, the hardhack, the goatbeard, the pear, the apple, the chokeberry, the mountain ash, the white thorn, the strawberry, the cinquefoil, the agrimony, the rose, and the sweetbrier.

From Newfoundland and Saskatchewan to New Jersey and Colorado, this species seeks low, wet ground, being almost as much of a wader as the pickerelweed (see Plate III).

So sweet is the purple avens' honey-cup that the bumblebee will often desert his favorite primrose for it, and very frequently grows so impatient for the flower's opening that he eats through the sepals in order to steal the sweets.

The purple avens' flowers nod their heads to keep the dew and rain from filling their cups and drowning their pollen.

CORN COCKLE

Agrostemma githago L. [Plate VII, left]

Whether the corn cockle is a beautiful flower or a pestiferous weed depends upon the point of view. Like the English sparrow and the rat, it insists upon residing with the farmer, whether he will or he won't, and unless it is to get the better of the argument he must keep fighting all the time.

The ox-eye daisy, the yarrow, the mulleins, and the plantains ask no specially prepared

seed-beds. They grow side by side with the grasses. But the corn cockle is a little more fastidious. It likes the same surroundings as wheat and matures its seeds at the same time. In this way it gets reaped and threshed with the grain, garnered with it, and sown again with it.

Thus it not only steals its bit of ground away from the wheat, but forces the farmer to cultivate it.

Like so many of the weeds that make the farmer's hard life harder, the corn cockle is an immigrant from Europe. It is a native of Asia, but followed civilization into Europe, and then crossed the seas to America in earth ballast, in packing straw, and in seed grain.

Once landed on these shores, its star of empire swept westward until it claims as its own the entire wheat-, barley-, rye-, and oats-growing territory of the New World.

Even in Shakespeare's time it was a pest. Biron, in "Love's Labour's Lost," exclaims, "Alons! Alons! sow'd cockle, reap't no corn." Still further back in the history of man we find Job exclaiming, "Let thistles grow instead of wheat and cockle instead of barley."

The United States Department of Agriculture classes the corn cockle as one of the principal poisonous plants, the dangerous qualities being contained in a soluble, odorless powder called saponin, which possesses a sharp burning taste and provokes violent sneezing when inhaled, even in small quantities. When agitated in water, it foams like soap.

When the corn cockle blossom opens it carries a fine "display ad." in magenta and white, announcing that messengers are wanted to convey pollen to other flowers. The length of the carriers' tongues rather than the fleetness of their wings is the test of employment. One species of night-flying moth never seeks service elsewhere, and while sipping the nectar of the cockle-cup and carrying the pollen from the blossom's anthers also takes occasion to lay its eggs in the heart of the flower, so that its larvæ may have a well-stocked larder of immature cockle seeds.

The corn cockle has many family relations, among them being the spurries, the pearworts, the chickweeds, the campions, the catchflies, and the carnations. Bouncing-bet and ragged-robin are likewise cousins.

LAMBKILL OR SHEEP LAUREL

Kalmia angustifolia L. [Plate VII, middle]

The heath family, of which the lambkill is a member, has many branches, ranging from the creeping snowberry and the trailing arbutus to the kalmias, the rhododendrons, the azaleas, the huckleberries, and the cranberries.

The lambkill is a shrub of lesser proportions than the common kalmia, or mountain laurel (whose biography appears on page 488 of the June, 1917, number of THE GEOGRAPHIC), and its flowers are similar but smaller and of a crimson pink. They cluster closely around the stem, which is terminated by newer leaves, this again being a point at variance with the larger species.

The range of the species is from Canada to Georgia.

GAYFEATHER OR BLAZING STAR

Lacinaria squarrosa (L.) Hill. [Plate VII, right]

The gayfeather, which possesses many other names in the vernacular, among them "colic root," "rattlesnake master," "blazing star," and "button snakeroot," flowers from June to September and is found as far north as Ontario, as far south as the Gulf of Mexico, and as far west as Nebraska.

The flowers at the top of the stem open first and those further down in the order of their position. All have both stamens and pistils, and cater to the long-tongued bees, flies, and moths.

The rural name of "rattlesnake master" comes from the belief that the tuber at the root of the plant possesses properties that will cure the bite of a rattlesnake.

PURPLE WILD-BERGAMOT

Monarda media Willd. [Plate VIII, left]

The purple wild-bergamot, like the hyssop skullcap, pictured on Plate IV, and described on page 53, is a member of the mint family. It is a variety, according to some authorities, of the species *Monarda fistulosa*. It grows in most thickets from the Appalachian Mountains west to Minnesota.

The *Monardas* are particularly adapted to the entertainment of the butterflies, though bumblebees also frequent them and sometimes hive bees are their guests. The two stamens and the two-parted pistils are so situated that no visitor whose tongue is long enough to sip the blossom's nectar can avoid a pollen dusting from the former or escape paying a pollen toll for the latter.

HAIRY PENTSTEMON OR BEARD TONGUE

Pentstemon hirsutus (L.) Willd. [Plate VIII, middle]

Flowering in midsummer, over a territory that stretches from Ontario and Manitoba to Florida and Texas, the hairy pentstemon is a member of the versatile figwort family, which includes the mulleins, the yellow toadflax, and the Indian paintbrush, described in previous issues of the NATIONAL GEOGRAPHIC MAGAZINE (May, 1915; June, 1916, and June, 1917, respectively). Its preferences in matter of environment lead it to dry or rocky fields, thickets, and open woods.

Its blossom first develops stamens and is therefore in the first stage of its existence a male flower. When these have given their pollen to the bees they are succeeded by pistils, which transform the blossom into a female flower. Thus cross-fertilization is assured.

The scientific name comes from the densely bearded, sterile fifth stamen. This stamen makes a series of curves from the upper to the under side of the flower, a fact which makes it serve admirably in closing the mouth of the

flower against pilfering invaders. A long-tongued bee has to thrust its head deep into the flower in order to get a sip of nectar, and in this way gets a face-dusting of pollen, which is communicated to the pistils of other flowers visited.

CRIMSON-EYE ROSEMALLOW

Hibiscus oculiroseus Britton. [Plate VIII, right]

One must go to the marshes along the coast of eastern United States to meet the beautiful crimson-eye rosemallow, which flowers from July to September.

It is a cousin of the gorgeous swamp rosemallow, described on page 587 of the June, 1916, number of THE NATIONAL GEOGRAPHIC, and is a native American plant, unlike the marsh-mallow, another cousin, which contributes so largely to the confectioner's art. Still another cousin is the okra plant, without which no southern vegetable garden is complete. Some of the mallows bear flowers that are unisexual—either male or female, possessing only stamens or pistils, as the case may be. Most of them, however, are bisexual, having both stamens and pistils, but accomplishing cross-fertilization by having the stamens wither before the pistils come to maturity.

BEACH PEA

Lathyrus maritimus (L.) Bigel. [Plate IX, left]

The beach pea, rejoicing in numerous other names, among them one denoting a rugged vitality—everlasting pea—belongs to the pulse family. Among its cousins are the wild indigo, the rattlebox, the lupines, the clovers, the tick trefoil, the nonesuch, the vetches, the hog peanut, the wild bean, and the Texas bluebonnet, which, along with the red clover, was described in the June, 1917, number of THE GEOGRAPHIC (pages 497 and 517).

The beach pea to its admirers mirrors the sea and the heavens—the clear green of the ocean in its leaves and the azure hues of the sky in its petals. It gladdens the sandy beaches of the seashore from New Jersey to the Arctic regions and from southern Oregon to northern Alaska.

The style of the flower's pistil is hairy on its inner side, and when the nectar-seeking bee lands for a sip of sweetness his movements cause the style to vibrate. It thus becomes an automatic duster, brushing the pollen onto his coat.

The beach pea, like many other members of the pulse family, has worked out its own system of cross-fertilization. The clover is a striking illustration of this. Without the aid of long-tongued bees it is unable to set seed. Australia could not grow clover from native seed until it imported bumblebees to fertilize the blossoms.

COMMON MILKWEED

Asclepias syriaca L. [Plate IX, right]

One does not admire the milkweed either for its beauty or its odor, but rather for its cunning. Its flowers lack brilliancy, and if one breaks the stem it exudes a sticky, milkish juice with a sickening odor. But in its methods of insuring the perpetuation of the species it displays unusual ingenuity in making the insects its servants, and it has been able to girdle the warm and temperate zones of the earth with its many hundred species.

Its blossoms are not fragrant to human beings, but they possess a wealth of nectar for bees, wasps, flies, beetles, and butterflies.

When these animated airplanes attempt to effect a landing on a blossom they find the landing stage very slippery; but as they maneuver about for a foothold they get their legs caught in fine little clefts at the base of the flower. Attempts to extricate themselves serve only to pull the imprisoned leg into a deep slot. Here it encounters a tiny pair of saddlebags filled with pollen.

With a vigorous jerk the insect is usually able to free the imprisoned leg, but as he does so the pollen saddlebags hang to it. Bees have been caught, according to Blanchan, with a dozen of these tiny saddlebags hanging to a single leg.

Flying away to another flower, the visitor is caught as before, but in the struggle to free himself he loosens some of the saddlebags adhering to his legs in such a way that the pollen they contain will finally find its way into stigmatic chambers. In this way cross-fertilization is assured.

Only strong-limbed insects can free themselves from the milkweed blossom; many a hive bee has been held prisoner until death ended its captivity.

Any one can study the milkweed's method by holding a house fly by one of its wings on the blossom. Trying to get a foothold, its leg will enter the slot. Extricate it, and the little saddlebags come along.

Not only does the milkweed use insects to insure the setting of seed, but it also employs the breezes. Each seed has its own bit of down, light as a feather, and as in ancient days men set out across the seas, in boats driven by the wind, to establish colonies in the ends of the earth, so the milkweed seed sets out on its tufts of down to find a place to grow.

The common milkweed grows from three to five feet tall, flowers from June to September, prefers roadsides, fields, and waste places, and is found from the Atlantic coast to the Rocky Mountains and from New Brunswick to South Carolina. It is a cousin of the butterfly-weed described on page 589 of the June, 1916, number of THE GEOGRAPHIC.

SWEETSHRUB

Calycanthus floridus L. [Plate X, left]

This delightfully fragrant shrub grows from four to eight feet high. In the north it is principally a cultivated garden plant, but in Virginia and the Carolinas and westward it grows wild in rich dry soils. It flowers from April to September, usually reaching the height of its season about wheat harvest.

While best known as sweetshrub, it sometimes is called strawberry shrub or Carolina

allspice. The *Calycanthus* family, to which it belongs, is a small one, and few of the members have the sweet odor of *floridus*.

POKEWEED

Phytolacca americana L. [Plate X, right]

The pokeweed's range is from Maine to Ontario and southward, where it flowers from July to September, in low grounds and rich soils. It masquerades under many names, such as poke, scoke, garget, and pigeon berry.

The pokeweed is a tall, smooth herb, growing from 4 to 12 feet high and possessing a strong-smelling juice. Its roots, which are perennial, are highly poisonous, yet its young shoots, or "sprouts," are edible and are often prepared like asparagus. Its shining purple berries form a late-summer feast for robins, flickers, downy woodpeckers, chewinks, and grosbeaks.

An ointment is made from the plant for the treatment of ringworm and rheumatism, and also for relieving itching and inflammation of the eyes.

This plant is said to have derived its name from an Indian word, "pocan," which is applied to any plant yielding a red or yellow dye. The followers of James K. Polk, in the Presidential campaign of 1844, wore the poke leaf as their emblem.

The *Halictus* bees are its principal insect visitors in flowering time. The poke prefers cross-fertilization, bringing its stamens to maturity before its pistils and thus giving insects a chance to carry its pollen to other plants. In stormy, rainy weather, when its benefactors cannot be on the wing, it curves its styles so as to bring the stigmas into contact with the anthers of the stamens, and thus brings about self-fertilization.

CLAMMY GROUNDCHERRY

Physalis heterophylla Nees. [Plate XI, left]

The subject of this sketch belongs to that ubiquitous nightshade family, which includes the potato, with its tuber, and the tomato, with its luscious fruit; the deadly nightshade, that does not belie its name; the horsenettle, the buffalo bur, the tobacco, the eggplant, the Jimson weed, henbane, and the matrimony vine.

The clammy groundcherry in its prime is an upstanding herb, but late in the season it sprawls. It usually grows from one to three feet high and claims most of North America east of the Rockies as its range. It requires rich soil.

CHARLOCK OR FIELD MUSTARD

Brassica arvensis (L.) Ktze. [Plate XI, right]

Charlock or field mustard is one of the undesirable aliens of the plant world that succeeded in passing the Ellis Island of American commerce and securing a foothold in this country for its pestiferous progeny. Exactly when it landed is not known, but it has spread throughout the grain-growing regions east of the Rocky Mountains.

This weed goes on its domineering way in spite of innumerable battles the careful farmer fights to repel its invasion. What farmer's son, too young to do the heavier work that farm operations demand, has not been detailed to go into the fields, armed with a hoe, to give battle to this invader so tenacious of life and of its "squatter sovereignty," and what wonder that a broiling sun, a big field, and this numerous foe have often caused a boy to lose interest in farm life and sent him on his way to the crowded city!

This plant, growing from one to two feet high, belongs to one of the largest families that botany knows, the mustard family. Its closest relatives in the family are the turnip, the rutabaga, and the black and white mustards. Its more distinct cousins include whitlowgrass, sweet alyssum, the cresses, peppergrass, shepherd's purse, and radishes.

The charlock blossoms in late summer. The brilliant *Syrphidæ* flies and honeybee, both having a fondness for yellow blossoms, come in great numbers and serve as pollen-bearers. The stamens mature ahead of the pistils.

MISTFLOWER

Eupatorium coelestinum L. [Plate XII, left]

This close relative of the joe-pye-weed, the white thoroughwort, the boneset, and the white snakeroot loves rich soils, in which it grows from New Jersey to Michigan, Kansas, and the Southwest. It is somewhat hairy, and, as a composite that has flowers ranging from violet to purple, it represents one of the most advanced members of the floral kingdom.

PINK CORYDALIS

Capnoides sempervirens (L.) Borck. [Plate XII, middle]

Cousin of the mountain fringe, the Dutchman's breeches, and the squirrelcorn, the pink corydalis belongs to the fumitory family, which is never intrusive, and would rather please the eye of man than get in his way. In New England it almost supplants the Dutchman's breeches. The stem is slender and erect and the stalk grows from eight inches to two feet tall. It prefers rocky soil and its range is from Maine to the Carolinas and westward to Minnesota.

NEW YORK ASTER

Aster novi-belgii L. [Plate XII, right]

With flowers ranging from pale violet to blue violet, the New York aster, sometimes known as the willow-leaved aster, lays claim, through Gray, to being "the commonest late-flowered aster of the Atlantic border." It has a head like an ox-eye daisy, except in color, with from fifteen to twenty-four rays. The stalk grows from one to three feet tall. It prefers the swamp to dry land and clings close to the coast from Maine to Georgia. It has several varieties, including *lævigatus* and *litoreus*, the former smooth and with upper leaves clasping the stem, the latter low and stiff.

TURTLEHEAD

Chelone lyoni Pursh. [Plate XIII, left]

Growing in ditches, beside streams, and amid swamps, this interesting member of the figwort family has many aliases in the vernacular. In some localities it is called "snake-head," in others "codhead." Some people call it "shell-flower," while others have christened it "balmony."

Its flowering season is from July to September and it is found in swamps and wet thickets in the mountains from Virginia southward. It attains a height of from one to three feet. The leaves are reputed to have tonic properties in the treatment of liver complaints.

Even bumblebees have difficulty in reaching the overflowing nectar cups of the turtlehead before it reaches maturity; but as soon as the heart-shaped anthers have their dust-bags of pollen powder ready, the flower opens wider and the visitors have their full of sweets while taking their dusting of pollen.

TEASEL

Dipsacus sylvestris Huds. [Plate XIII, right]

The chief distinction of this species is the fact that it is the parent of the cultivated teasel so widely used in raising the nap on various woolen cloths. The wild species have straight prickles on the heads and are therefore valueless in cloth finishing; the cultivated teasel has the hooked prickles.

The heads of the cultivated variety are fixed around a long cylinder, or roll, which is made to revolve against the surface of the cloth. The hooks of the prickles take hold as they turn and raise the nap. No mechanism has yet been devised that can take the place of the teasel bracts, with their combined rigidity and elasticity. They are strong enough to nap the cloth, but too weak to tear it.

The leaves grow out from the teasel stem in such a way that they form little cups at their base. These collect dew and rain, the water serving to keep ants and other creeping creatures from reaching the flowers, in the same way that tin disks on hawsers keep rats from going between ships and docks.

Each tiny floret on the teasel's head consists of a long tubular corolla made up of four petals grown together. The exposed parts of these petals are of pale lilac; the lower, almost hidden, parts are white.

On the first day of the floret's life their four anthers show and shed pollen. On the second day these wither and the pistil comes to maturity.

The spiky nature of the teasel's head prevents insects from walking over it. Therefore they must dive head foremost into the tubes if they want the honey these have to offer. Thus they always carry pollen from the flowers with mature stamens to those with mature pistils.

The teasel blossoms from July to September over a range that reaches from Maine and Ontario to Virginia and the Mississippi River. It prefers roadsides and waste places.

VENUS LOOKING-GLASS

Specularia perfoliata (L.) A. DC. [Plate XIV, left]

This member of the bluebell family has a wand-like stem that is sometimes too weak to stand alone, and is often found leaning on surrounding vegetation for support. It blossoms from May to August and grows almost everywhere, from upper Canada to middle Mexico, preferring waste places and dry woods.

The late John Burroughs thus describes this flower: "A pretty and curious little weed, sometimes found growing in the edge of the garden, is the clasping *Specularia*, a relative of the harebell and of the European Venus looking-glass. Its leaves are shell-shaped, and clasp the stalk so as to form little, shallow cups. In the bottom of each cup three buds appear that never expand into flowers, but when the top of the stalk is reached, one, and sometimes two, buds open wide into a large, delicate, purple-blue corolla. All the first-born of this plant are still-born, as it were; only the latest, which spring from its summit, attain to perfect bloom."

FERNLEAF FALSE-FOXGLOVE

Aureolaria pedicularia (L.) Raf. [Plate XIV, middle]

This bright member of the figwort family, growing from one to three feet tall and having lemon-colored, bell-shaped flowers an inch or more in diameter, would be worthy of cultivation if it were not a dangerous companion for the honest folk of the flower garden. In the biographies of the mistletoe (see THE GEOGRAPHIC for June, 1917) and the dodder (see page 59) we see how honest plants have degenerated into vampires—blood-suckers that live not by their own toil, but by invading the vitals of other plants for sustenance.

The false-foxgloves have only recently started on this downward path, but they have gone far enough to wrap their roots around those of other plants and steal their juices. Knowing their traits, no gardener will invite them into his garden, and they must therefore be content to live on the borders of dry woodlands and thickets in their natural range, which is from Maine west and south to Minnesota and Missouri.

BLUEBELL

Campanula rotundifolia L. [Plate XIV, right]

No flower in all Nature's garden has more of romance and interest clustering about it than the bluebell. What heart has not thrilled at the lore and legends of the bluebells of Scotland! And yet Scotland has no monopoly of them. They are at home throughout much of the Northern Hemisphere, gladdening impartially the Asiatic regions of Europe, Asia, and America. In America they wander as far south as the Mason and Dixon Line in the East, to Arizona in the Rockies, and to California in the Sierras.

A dainty and delicate perennial is this modest flower, but with enough strength to climb 5,000 feet without turning a leaf.

Another name of the bluebell is harebell, a survival of the days of poor spellers, who spelled hair with an "e." It was known in Scotland as the "hairbell" because of the filamental nature of its branches. Other old English names for the bluebell were "ladies' thimble" and "witch's thimble."

The flowering season of the bluebell is from June to September.

TANSY OR BITTER BUTTON

Tanacetum vulgare L. [Plate XV, left]

The tansy is an example of a flower that has not yet learned the art of display in advertising. By an effective use of white or colored rays or petals, the ox-eye daisy, the black-eyed-susan, and other flowers can accomplish more with one head on a branch than the tansy does with a dozen. Many plants have forty of these heads, and each head contains some 400 florets, 16,000 florets to a plant.

This plant grows from eighteen to forty inches tall, loves the roadsides, and ranges from Nova Scotia to North Carolina and Missouri. It blooms from July to September.

Like many another plant, the tansy came to America as a cultivated herb. The colonists thought they could not do without their tansy herbs and bitters, and least of all without their tansy tea. But, once here, the tansy got tired of the coddling of the garden and gave ear to the call of the wild.

Under a lens the leaves are seen to be dotted with glands containing the oil that gives the plant its strongly aromatic flavor and scent. It is this oil that has given the tansy its value in medicine and cookery.

SILVER ASTER

Aster concolor L. [Plate XV, middle]

Growing in dry, sandy soil near the coast, in Massachusetts and southward, this attractive member of the aster branch of the composite family has a stem from two to three feet tall, unbranched below the flower, and with leaves crowded and pressed close to it.

Sir John Lubbock was of the opinion that all flowers originally were merely pistils and stamens surrounded by green leaves. Blue has been shown to be the favorite color of bees, and in their efforts to please, the flowers have first produced either white or yellow petals and rays, and then have become red, as a rule, before being able to stand among the elite blues.

EARLY GOLDENROD

Solidago juncea Ait. [Plate XV, right]

As was related in the biography of the field goldenrod, which appeared in the June, 1917, number of THE GEOGRAPHIC, the goldenrods have representatives in almost every month of the floral calendar, in almost every kind of soil, and in almost every locality. The subject of this sketch comes into bloom by the end of June and remains until the end of September. It grows from two to four feet tall on dry, rocky banks and along roadsides from Maine to North Carolina and westward to Missouri.

With their wealth of blossoms the goldenrods are indeed the merchant princes of flowerland. Their showy display advertising catches the eyes of innumerable hosts of insects, and they do a land-office business in the distribution of their pollen.

ORANGE MILKWORT

Polygala lutea L. [Plate XVI, left]

Rejoicing in its bucolic name of wild bachelor's button, the orange milkwort, or wild bachelor's button, has clover-like heads closely packed with small florets. The plant grows from 6 to 12 inches tall. *Polygala's* flowering season is from June to October, and it is equally at home in the swamps of Long Island, the pine barrens of New Jersey, the coasts of Florida, and the lowlands of Louisiana.

Some of the milkwort species have two sets of flowers, "one for beauty and one for use, one playful for the world and one serious for posterity."

In truth, however, such milkworts, afraid that their fine flowers may fail to set seed, because the rains keep the bees indoors, or some other catastrophe occurs, have another set, much less showy, whose development was arrested in the bud. Without petals, nectaries, or fragrance, their stamens are small, their pistils immature, and they have nothing to offer the bee. But if their showy sisters fail to perpetuate the family, they step in, self-fertilized, and save the family from extinction.

COMMON DODDER

Cuscuta gronovii Willd. [Plate XVI, right]

Cousin of the bindweeds and the morning-glories, the common dodder is a black sheep of a proud family. Early in life it is well-behaved, getting its living from the soil in an orthodox fashion. But just as soon as it finds a suitable plant upon which to attach itself, it sends out innumerable tiny suckers that gradually exhaust the juices of the plant upon which it makes its parasitic attack. While it is drinking the life sap of its unwilling host it forgets to maintain its connection with the soil, the stem from the ground wasting away, and if its host perishes it must die also.

Living off of juices other plants have drawn out of the soil, it loses its chlorophyll and becomes a leafless, scale-bearing plant.

The dodder develops an abundant supply of globular seed-vessels. These either fall to the ground and sink into the soil or float off in the water to found new colonies.

Known in some places as the "love vine" and elsewhere as "angel's hair," the dodder flowers from July to September and finds its preferred habitat in moist soil, meadows, ditches, and beside streams. Its range is from Nova Scotia and Manitoba to the Gulf States.

THE COMPLETED APSE OF THE WASHINGTON CATHEDRAL, ON MOUNT ST. ALBAN

Situated on a beautifully wooded crest, this shrine fulfills plans conceived by George Washington for a church in the Capital City to be devoted to national purposes. Its erection was begun in 1915. Several famous cathedrals in England contributed some of their ancient stones and marbles to be made into carvings and statues for its adornment. The main body of the cathedral, measuring 500 feet from the western front to the apse at the easterly end, will be equal in length to any of the English cathedrals except York (see text, page 81).

CATHEDRALS OF THE OLD AND NEW WORLD

By J. Bernard Walker

With Illustrations from Photographs in the National Geographic Society Collections

AMONG the capital cities of the world, Washington carries the unenviable distinction that it possesses no monumental building dedicated to the worship of God.

France has its Notre Dame, London its Westminster, Rome its St. Peter's, and even in far-distant Constantinople the majestic dome of Sancta Sophia puts the Moslem people in perpetual remembrance of their God and His Prophet.

But Washington, the capital of the greatest nation of these later days, for all its superb display of costly buildings—governmental, municipal, and memorial—has seemingly forgotten to raise any national tribute to that God of our fathers in recognition of whom the Republic was founded, and under whose fostering care it has grown to its present commanding position among the sovereign states of the world.

Not to any neglect of George Washington and the founders of the Republic may this anomaly be charged. On the contrary, the scheme for a representative national church of becoming size and dignity occupied the mind of the Father of his Country, and he saw to it that when Major L'Enfant drafted the plans of the Federal City a large plot of land, centrally situated, should be reserved for such a purpose. Upon that square now stands the red, Brobdingnagian pile of the Pension Office Building.

So far as the question of site is concerned, the change in the city's plans is not to be regretted; for the new Protestant Cathedral of Saints Peter and Paul, whose recently completed apse lifts its delicate beauty upon the summit of Mount St. Alban, will occupy the noblest site of any cathedral in the Old World or the New. Conspicuous from any point in Washington, the 500-feet stretch of nave and choir, crowned by the lofty towers of the western front and the crossing, will be visible also throughout a far-flung radius of the surrounding country.

A CATHEDRAL SET ON A HILL

Every American who has made a tour of the cathedrals of Europe must have regretted that, more often than not, these noble structures are so closely beset with commonplace buildings as to render any near view of their beauties impossible.

The Washington cathedral will suffer no such disadvantage. The site, comprising 60 acres of beautifully wooded land, lies on the crest of a hill, at an elevation of nearly 400 feet above the Potomac River. In every direction the ground falls away from the Cathedral close, with the result that, from whatever side it is viewed, this superb structure will be revealed against the skyline in all its unobstructed majesty.

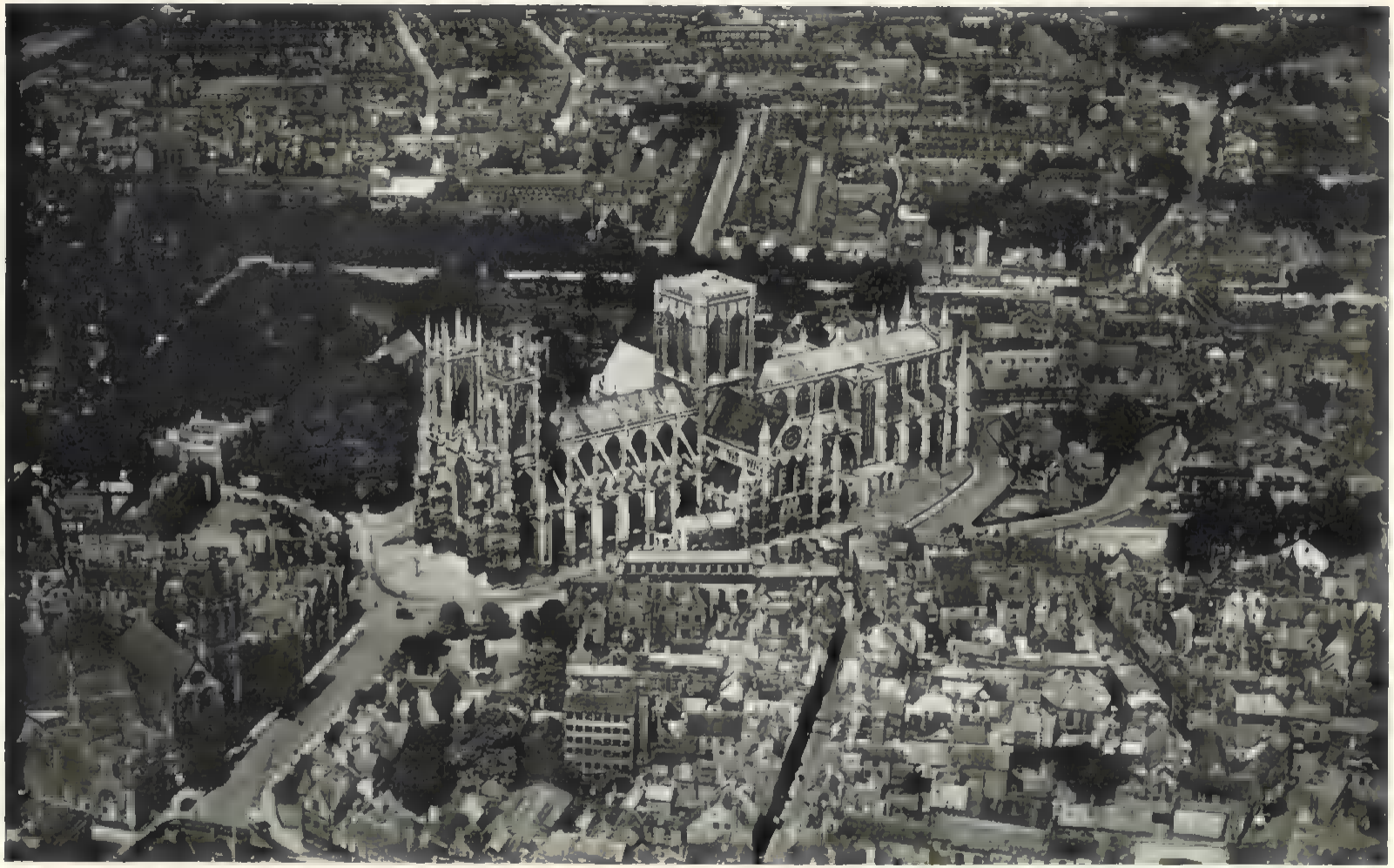
COMPARISON WITH THE CATHEDRALS OF EUROPE

Be he amateur or professional, every student of the Washington cathedral will inevitably turn to the Gothic cathedrals of England and France for a scale wherewith to judge of its size and architectural quality; and the accompanying table, in which are included some of the largest and most notable of these, serves to show that it will rank with the largest existing cathedrals in size. Moreover, in the perfection of its proportions and the purity of its style it will stand without a peer.

	Extreme outside length.	Width of nave, center to center of piers.	Height of nave.	Height of towers.
Washington	500	45	95	262
Westminster	505	40	102	225
Lincoln	500	46	82	271
York	518	53	93	198
Ely	525	37	72	215
Canterbury	543	33	78½	229½
Winchester	556	40	77	140
Notre Dame	442	46	110	226
Amiens	475	48	140	223
Beauvais	Choir only	52	157½	...

The writer ventures this statement without fear of successful contradiction.

The revival of interest in Gothic architecture, which began in the middle of the nineteenth century, has gradually developed a group of architects, at once enthusiastic, serious, and scholarly, whose work bears abundant evidence that they not only have caught the fine spirit of the medieval builders, but are capable of



Photograph from "Topical" © Central Aerophoto Co., Ltd.

YORK MINSTER SEEN FROM THE AIR

York Minster is noted for its size and simple, impressive dignity. It contains a rare collection of early English stained glass, especially in the beautiful rose window of the south transept and in the north transept lancet windows called the Five Sisters. The "cathedra," or bishop's seat, was the center around which missionaries who were strangers in a foreign land naturally gathered in the Dark Ages. These communities were often the sole refuge of the oppressed, the chief repository of learning, and the staunch bulwark of the Christian faith.

CANTERBURY CATHEDRAL

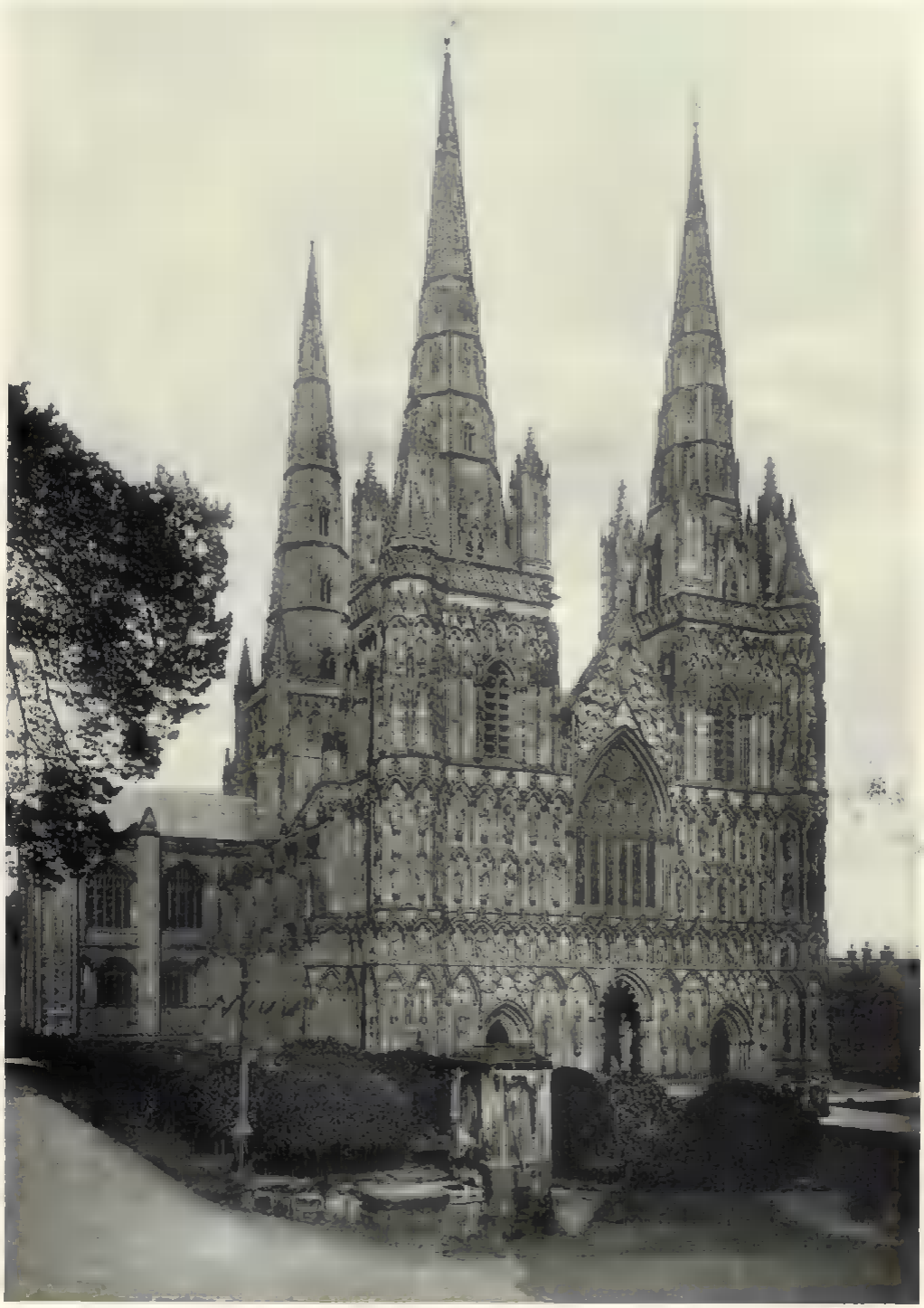
This edifice is by far the most important of all church structures in England. The interest which attaches to it is due, not to its architecture, but to its vastness of scale, wealth of monuments, rare store of thirteenth century glass, and treasured memories of grave historical scenes enacted within its walls. The first church on this site was begun in 597.

DURHAM CATHEDRAL, "HALF CHURCH OF GOD, HALF CASTLE 'GAINST THE SCOT"

A massive, romantic pile, the Norman cathedral of St. Cuthbert is not beautiful externally, but its situation on a densely wooded cliff gives it a peculiar charm. There is a legend that the monks of Lindisfarne were led to its site by a dun cow. The cathedral contains the tomb of the saint and also that of the Venerable Bede, monk and early historian, who died in 735. Practically all the great cathedrals and monastic structures in England were rebuilt after the Norman conquest.

THE CHOIR OF DURHAM CATHEDRAL

The impression made by the magnificent Norman character of the interior is one of "rocky solidity and indeterminable duration." Three incised columns, channeled in spiral, chevron, and trellis patterns, are a prominent feature of the nave. The choir is remarkable for the highly ingenious and artistic union of elaborate Gothic work and massive Norman features. At a certain spot on the pavement is a cross of "blewe marble," marking the limit of the distance to which women might formerly approach the altar.



LICHFIELD CATHEDRAL, ENGLAND'S "QUEEN OF MINSTERS"

This small but beautiful edifice holds its title by virtue of its exquisite proportions, graceful outlines, and rich ornamentation. The three symmetrical spires are called "The Ladies of the Vale." The building is of red sandstone and the main portion dates from the 13th-14th century. Both in England and on the continent, cathedral-building reached its artistic pinnacle during the Middle Ages, and justified Goethe's famous aphorism, "Architecture is frozen music."

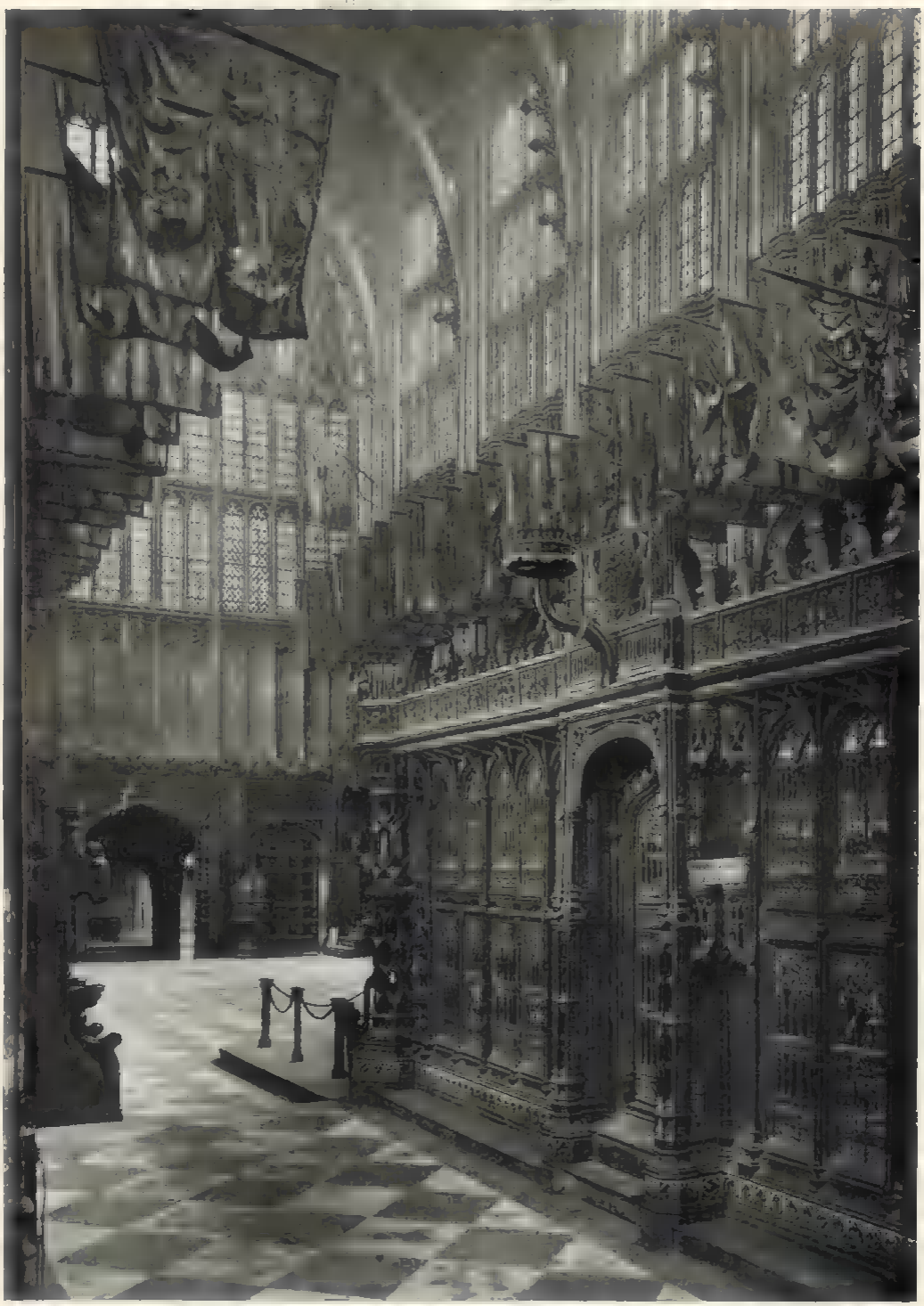
© Horace K. Turner, B. Kabatznick, Successor.

WESTMINSTER ABBEY, ENGLAND'S HALL OF FAME, AND THE WESTMINSTER COLUMN

The most celebrated shrine of the English-speaking people dates from 1049. Many of the world's greatest benefactors are buried within its walls, where Washington Irving says, "We feel that we are surrounded by the congregated bones of the great men of past times, who have filled the earth with their renown." The column commemorates the Old Boys of Westminster School who fell in the Crimean War and the Indian Mutiny. Near by stands a copy of the Saint Gaudens bronze statue of Lincoln, unveiled in 1921. (See interior views on pages 68, 69, and 70.)

THE CHOIR, WESTMINSTER ABBEY

The interior of Westminster is noted for its perfect Gothic proportions, which show a marked French influence. The nave and choir, 102 feet in height, are the tallest in England. Just outside the picture is the Poets' Corner, in which the international fame of Longfellow is commemorated by a bust. (See also illustrations on pages 67, 69, and 70.)



THE CHAPEL AND TOMB OF HENRY VII, WESTMINSTER ABBEY

This shrine, one of the latest and finest examples of Perpendicular Gothic, is considered an architectural gem. The ceiling is vaulted with the most delicate and lacelike fan tracery. Mary Queen of Scots and Queen Elizabeth are among the monarchs buried in this chapel.

THE CORONATION CHAIR, WESTMINSTER ABBEY

Under the seat of the Coronation Chair is the Stone of Scone, the emblem of power of the Scottish princes. Tradition says Jacob once used it as a pillow. Edward I brought it to England in 1297, in token of the subjugation of Scotland. Since that time every English monarch has been crowned in this chair except Edward V, who was never crowned, but was murdered in the Tower by order of his uncle, the Duke of Gloucester.

THE INTERIOR OF WINCHESTER CATHEDRAL

The beauty of its proportions, the great length of the nave, and the fine groining lend impressiveness to this interior. The choir is supposed to have been dedicated to Saint Swithin. His connection with the weather is ascribed to the legend that the removal of his body to the shrine prepared for it was delayed forty days by rain. (See also illustration, page 72.)

Photograph from "Topical" © Central Aerophoto Co., Ltd.

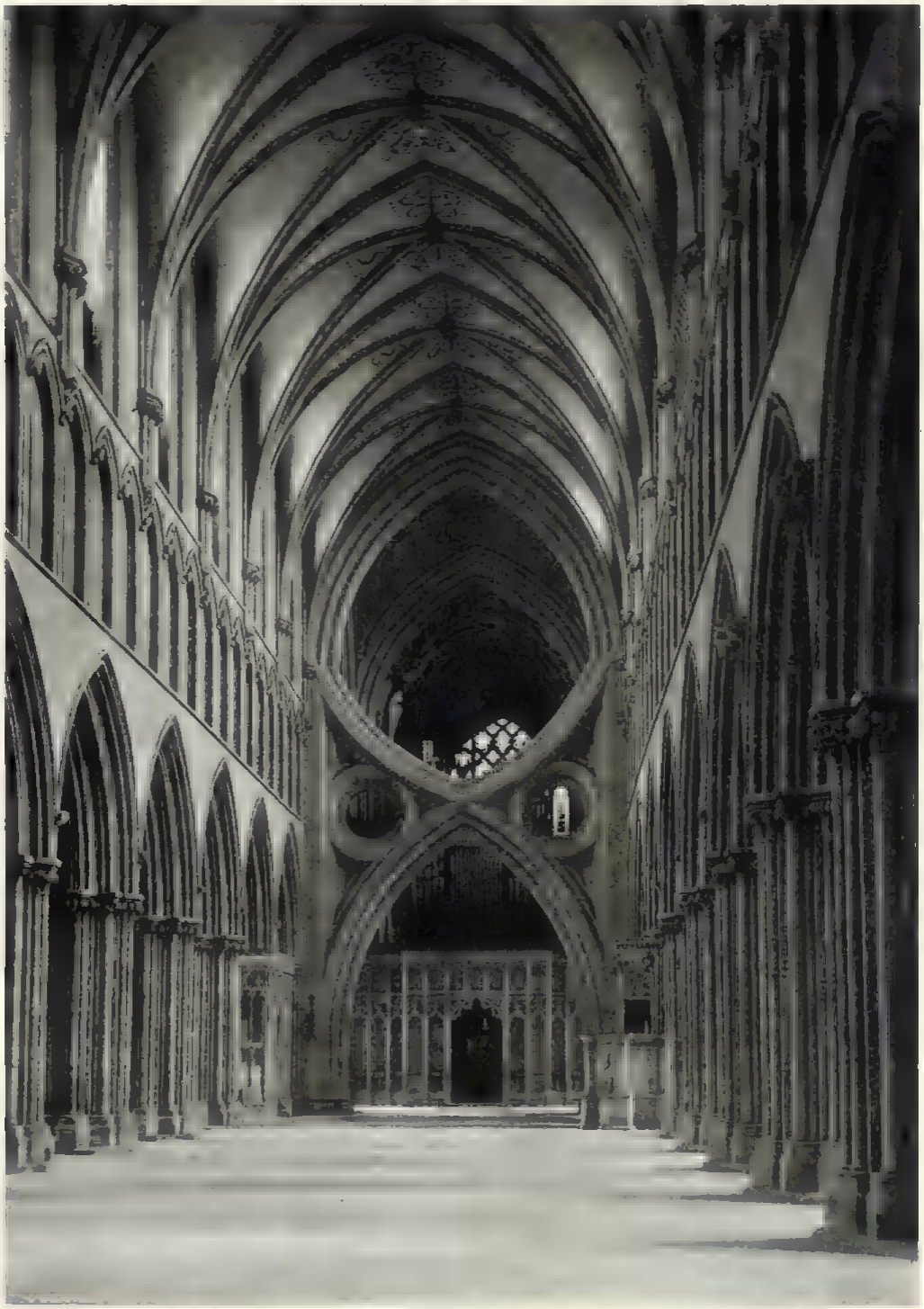
WINCHESTER CATHEDRAL

Plain and uninviting externally, Winchester is one of the richest and most beautiful of cathedrals within (see page 71). It is the longest church in England and incorporates every style of English architecture, from the Norman to the Perpendicular. Many men of note in English history are buried here.

Photograph "Topical" © Central Aerophoto Co., Ltd.

WELLS CATHEDRAL—"AN ABODE OF ANCIENT PEACE"

One distinguished authority, declaring that this group of ecclesiastical buildings has no rival among cathedrals in all the world, says: "To most of these objects, taken singly, it would be easy to find rivals which would equal or surpass them. The church itself cannot, from mere lack of bulk, hold its ground against the soaring apse of Amiens (page 83), or against the windows ranging, tier above tier, in the mighty eastern gable of Ely (page 77). The cloister cannot measure itself with Gloucester or Salisbury (page 76); the chapter-house lacks the soaring roofs of York (page 62) and Lincoln (page 80); the palace itself finds its rival in the ruined pile of St. David's. The peculiar charm and glory of Wells lies in the union and harmonious grouping of all." (See interior view, page 74.)



THE INVERTED ARCHES OF THE WELLS CATHEDRAL

This curious St. Andrew's Cross shows how builders of the Middle Ages could convert a necessity into a beautiful architectural feature. During the construction of the central tower (see page 73), it was discovered that the four piers supporting it were weak. A second lower arch was built and a third inverted arch was then added. Thus the piers receive a steady support along their whole height.

THE CHOIR OF SALISBURY CATHEDRAL

Though finely proportioned and impressive, the interior of this church produces a rather cold and bare effect, due to the absence of painted glass (destroyed by the Puritan Reformers) and the rearrangement of the memorial tombs by the so-called restorer Wyatt. Hardly a trace of foreign influence appears. Salisbury is one of the few great cathedrals begun and practically completed within the span of a single generation—between 1220 and 1260. For an exterior view see page 76.

SALISBURY CATHEDRAL

Externally, Salisbury is considered by many the most beautiful of all English cathedrals and one of the least interesting within (see page 75). It presents a fine example of pure Early English workmanship and is noted for uniformity and harmony of construction—"one of the most poetic designs of the Middle Ages." The spire (404 feet) is the tallest in England.

THE ELY CATHEDRAL

This is one of the most individual of all church buildings in England. Its unusual features are the massive castellated Western Tower and the central Octagon.

THE WEST FRONT OF THE PETERBOROUGH CATHEDRAL

The visitor enters the precinct of this majestic religious edifice through a Gothic gateway, seen in the right foreground. In form, proportion, and general effect, this west front is perhaps unrivaled in Gothic architecture. Catherine of Aragon, Henry VIII's unhappy queen, is buried here.

Photograph from "Topical" © Central Aerophoto Co., Ltd.

AIRPLANE VIEW OF ST. PAUL'S CATHEDRAL

This truly noble Renaissance building in the heart of London is the masterpiece of Sir Christopher Wren. The most imposing feature is the central dome, which is acknowledged to be one of the finest that ever crowned a great church. St. Paul's is the burial-place of the famous naval and military heroes of Great Britain, the most conspicuous shrines being those of Nelson and Wellington.

THE NAVE OF LINCOLN CATHEDRAL

The interior of Lincoln's shrine is harmonious and imposing, although some critics declare that the vaulting is too low for the width of the nave. The choir is a very early example of the Gothic style. The presbytery, or Angels' choir, has been pronounced "one of the loveliest of human works." The first church on this site, erected in 1072-92, was split in two, from top to bottom, by an earthquake in 1185. The present structure, with its three lofty towers, crowning a hill, dates from the time of Bishop Hugh of Avalon who came to England in 1186.

avoiding the constructive and decorative exaggerations into which the architects of those days were apt at times to stray.

By a study of the table of comparative dimensions, it will be seen that the main body of the Washington cathedral, measuring 500 feet from the western front to the apse at the easterly end, will be equal in length to any of the English cathedrals except York, which exceeds it by a few feet (see page 62).

The length given for Canterbury, Winchester, Ely, and Westminster includes certain subsidiary buildings, erected in some cases centuries after the main structure and scarcely to be reckoned in an estimate of the over-all length of the main church. Such are the curious Becket Chapel (40 feet) at Canterbury, the Galilee porch (45 feet) at Ely, the Lady Chapel (40 feet) at Winchester, and Henry VII's Chapel (120 feet) at Westminster, where the length of the main church is 410 feet.

The Washington building will be longer than any French cathedral, exceeding Amiens (page 83) by 25 feet and Notre Dame, Paris (page 88), by 58 feet.

The widths of the naves are taken between the centers of the piers. The Washington nave, 45 feet, exceeds Canterbury by 12, Ely by 8, Winchester by 5, and Westminster by 5 feet. Lincoln is wider by 1 foot and York by 8 feet. The French cathedrals given are wider, as to their naves, by from 1 to 7 feet.

In height the Washington nave (95 feet) exceeds all of the English examples except Westminster (page 67), whose apex is 103 feet above the floor. It is outclassed by the French cathedrals, with their vast altitudes of 110, 125, and 157½ feet.

COMPROMISE BETWEEN FRENCH AND ENGLISH PROPORTIONS

In respect of its proportions, the Washington nave escapes the exaggerated length of the English and the disproportionate height of the French cathedrals. As a rule, the English cathedrals are too long for their height, the French too high for their length.

The English monastical builders sought to impress by far-reaching vistas of enormous length, the French by carrying their vaults to awe-inspiring heights.

In the Washington cathedral, with 95 feet of height to 500 feet of length, the architect has found the happy mean of proportional propriety.

Majestic will be the long 500-foot sweep of the nave, choir, and apse, lifting the ridge of their roofs to a uniform height of 134 feet above grade, and relieved by the bold projection of the transept and by the suitably proportioned masses of the two western towers and the great central tower at the intersection of nave and transept.

That this majesty has been secured without any sacrifice of grace and delicate beauty will be evident from a study of the photograph on page 60, showing the already completed apse.

THE CENTRAL TOWER TO BE CHIEF GLORY

The detached buttress piers, surmounted by pinnacles; the flying buttresses between these piers and the clearstory wall; the finely traceried clearstory windows; the boldly battlemented parapet, broken by the pinnacled wall buttresses, with the steeply pitched roof above—all of these will be repeated, with modifications, throughout the walls of the choir and transept.

The nave, although designed in the same Fourteenth Century English Gothic, will be somewhat more sober in treatment than the choir; for we miss here, both on the outer piers and on the wall buttresses, the ornate pinnacles which enrich the choir.

The risk of monotony in a building of this length, due to the repetition of similar forms, is further avoided by extending the side aisles of the choir only to the fifth bay from the tower. Beyond this the wall rises flush from base to parapet, with the buttress piers standing clear of the wall and many feet distant therefrom—all with a most pleasing variety of architectural effect.

In any exterior view of the cathedral, its crowning glory will be found in the great central tower, which rises 262 feet above grade, or 33 feet higher than the lovely Angel Tower at Canterbury, which (in all justice be it said) may be surpassed in height, but in beauty never (see illustration, page 63).

The Washington tower, in spite of its greater mass, possesses the charm which is inherent in good architectural proportioning. As at Canterbury, the vertical

Photograph by Creté

RHEIMS CATHEDRAL, BEST BELOVED SHRINE IN FRANCE, BEFORE ITS BAPTISM OF FIRE

Happily, German guns did not destroy all the beauty of this wonderful cathedral. The Rose Window is gone, however, and many of the 550 statues which adorned the portals. Many kings of France were crowned here. A statue of Jeanne d'Arc stands before the entrance, recalling the historic incident of the part played by the Maid of Orleans in the coronation of Charles VII in this cathedral. A copy of the statue now stands in Meridian Hill Park, Washington.

AMIENS CATHEDRAL

Although regarded as too short for its height, this cathedral is one of the noblest churches of the Old World and has been called "The Parthenon of Gothic Architecture." Colossal statues of twenty-two kings of France stud the gallery in the façade. The deeply recessed portals are dedicated to the Saviour, the Virgin, and to St. Firmin, the first bishop of Amiens.

Photograph by L. Boulanger

ROUEN CATHEDRAL

Considered one of the finest Gothic edifices in Normandy, Rouen's Notre Dame is nevertheless unsymmetrical in plan. The cast-iron spire surmounting the central tower is the loftiest in France—485 feet. With the exception of the highest story, the St. Romain tower (at the left) dates from the twelfth century and is the oldest part of the building.

TOURS CATHEDRAL

The façade, constructed from 1426 to 1547, is a notable example of the waning Gothic style called Flamboyant. Henry IV said it was a jewel for which only the casket was wanting. It is noted for the beauty of its richly colored glass windows. The two towers, 226 and 230 feet in height, are in the Renaissance style of the sixteenth century.

Photograph by P. O. Bugge

TRONDHJEM CATHEDRAL, NORWAY

Begun about 1020, this pride and glory of Norway is the most northerly cathedral in Europe. The architecture of the oldest parts is Norman, but many changes along early English lines were made. The kings of Norway are crowned here. The cathedral contains the tomb of St. Olaf, the national hero.

Photograph by Creté

THE NAVE OF PARIS' GREAT CATHEDRAL

The most striking features of Notre Dame's interior are the rose windows representing Christ and the Virgin surrounded by the prophets, and the celebrated carvings on choir and pulpit. The vaulting is supported by 75 pillars. For an exterior view see page 88.

Photograph by Creté

NOTRE DAME, BESIDE THE SEINE—A TREASURY OF HISTORICAL ASSOCIATIONS

Over the doors are exquisite examples of early Gothic sculpture representing the "Last Judgment," the "Triumph of the Virgin," and events in the life of Saint Anne. The towers are encircled with gargoyles and grotesque monsters that have gazed down at the city for centuries. For an interior view see page 87.

THE EXQUISITE SCULPTURES IN THE CHARTRES CATHEDRAL HAVE BEEN CALLED POINT-LACE IN STONE

In its present form the Chartres Cathedral, which is one of the grandest Gothic edifices in France, was consecrated in 1260. The choir screen, with its 41 sculptured groups representing scenes in the lives of the Madonna and of Christ, was begun in 1514 and completed two centuries later.

© Publishers' Photo Service

THE CATHEDRAL OF SEVILLE (SEE ALSO PAGE 92)

This is the second largest church in Europe and is one of the richest and most imposing structures in the world (see text, page 112). "Let us erect such a cathedral that posterity shall say we were madmen," reads the resolution adopted in 1401 for the construction of the edifice.

lines are emphasized at the expense of the horizontal—an effect which is due chiefly to the absolutely plain, square masses which form the corners of the tower and extend without a break from roof to parapet. The same motif reveals itself, with even greater emphasis, in the towers which flank the southerly front of the transept.

Additional variety is given to the southwest view of the cathedral by two octagonal structures—a turret stairway built against the wall of the nave at the fourth bay from the transept, and the finely proportioned baptistery, access to which from the church is had through a groined corridor.

The tall traceried windows of the baptistery, with flying buttresses between, surmounted by a rich parapet and a lofty eight-sided roof, render this an architectural gem in itself and a worthy adjunct to the great church which it flanks.

THE WESTERN FRONT

In appraising the architectural merit of a modern cathedral we inevitably and very properly compare it with the superb ecclesiastical buildings which are the sole surviving evidence, on the grand scale, of the architectural genius of the Middle Ages.

They are indeed a priceless heritage for the archeologist and a veritable encyclopedia for the guidance of the modern architect.

If we thus refer to the ancient cathedrals for a measure of the excellence of the Washington façade, we are confronted with an anomaly; for we find that whereas the French architects endeavored to make their fronts a notable feature, if not the noblest, of the whole cathedral, the English, in the majority of cases, seem to have given little thought to the western front and to have been content to erect a rather modest entrance at the side of the nave.

Only at York (page 62), Wells (page 73), and Peterborough (page 78) has an attempt been made to render the western front and its porches a worthy expression of the great structure beyond.

The French delighted in deep and lofty porches, never providing less than three and sometimes as many as five, all enriched with such a wealth of sculpture that it frequently flowed over and spread itself throughout the whole area of the façade, to the very top of its great flanking towers.

Too often the English façades are cold, formal, and altogether inexpressive of the size and rich variety of the body of the church beyond.

And here again we think that the architect of the Washington cathedral has found the happy mean. The lofty central porch, 90 feet in height, and the two side porches, 60 feet high, not only correspond in strict proportion to the nave and side aisles to which they, severally, form the entrance, but by their great height and width, and the fact that they are recessed fully 40 feet beyond the face of the façade, they challenge comparison with Peterborough, the finest of the English examples, and with the justly famous porches of Rheims (page 82) and Amiens (page 83).

The treatment of the western towers is marked by the fine restraint and well-balanced sense of proportion, which characterizes the whole fabric of the cathedral. The embellishment, in the form of statuary and decorative carving, is rich without being excessive.

The buttressing is strong, simple, and so drawn as to emphasize the height of the towers. Moreover (and this marks always the true artist in monumental building), there is an ample and satisfying area of plain, undecorated wall surface.

THE NAVE

The sense of restful satisfaction with which we look upon a perfect architectural work is due to the perfect proportion of its linear dimensions, the nice balance of its masses, and the good taste with which its decorative enrichment is applied. The Washington nave meets each of those requirements.

Entering the nave from the west, the eye ranges through the full length of the cathedral — nave, crossing, choir, and sanctuary—to rest upon the far-distant stained-glass windows of the apse. The long line of stately columns, the rich triforium, the spacious and deeply recessed windows of the clearstory, lift the eye to the unbroken line of the vaulted ceiling, the whole combining to give instantly an

© Publishers' Photo Service

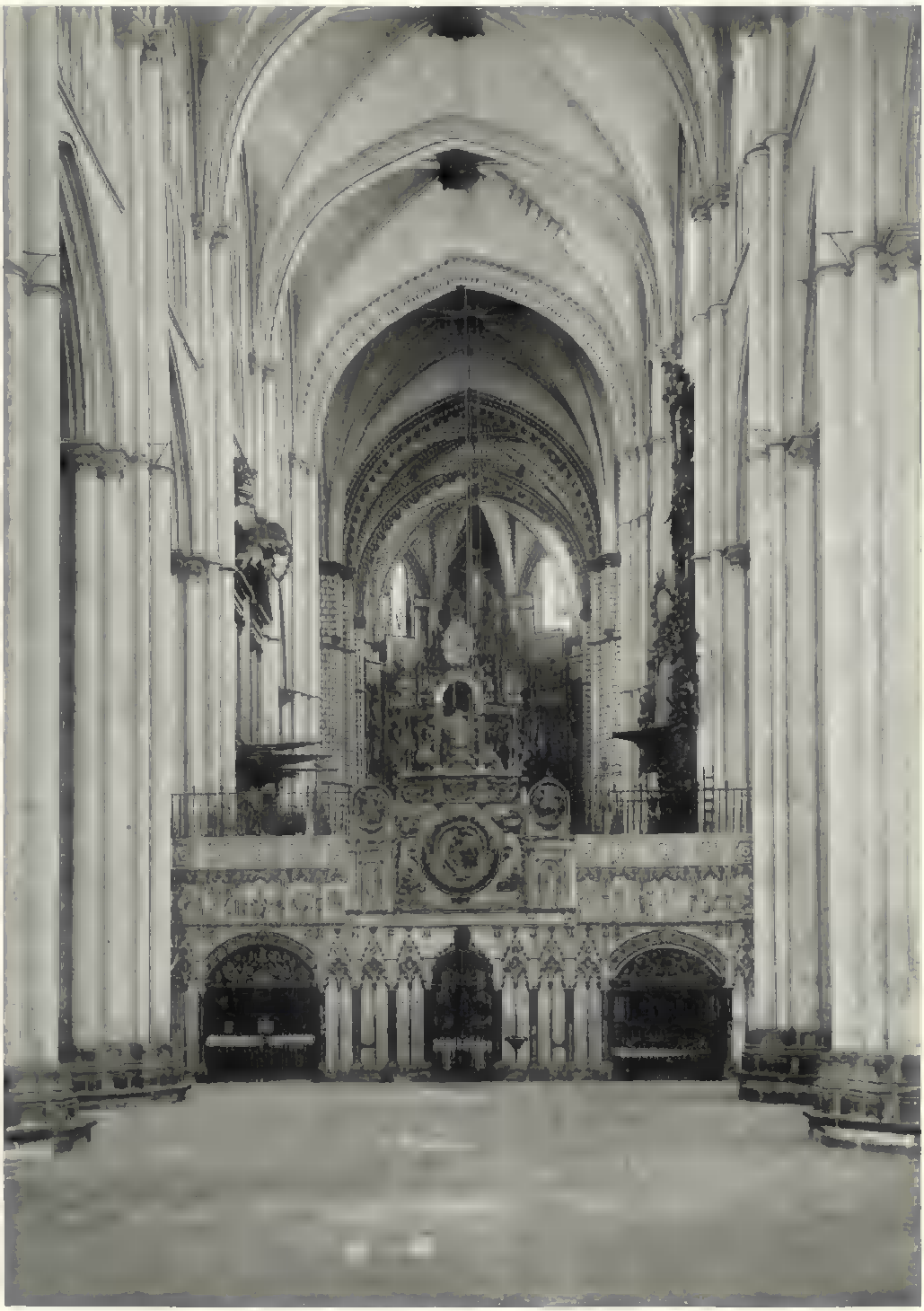
THE REPUTED CASKET OF COLUMBUS IN THE SEVILLE CATHEDRAL

Most historians maintain that the body of Columbus rests in Santo Domingo, where it was brought after his death in Spain. The bones removed by the Spaniards to Seville when the island was surrendered to the French are, in all probability, those of Diego Columbus, son of the great admiral.

© E. M. Newman

BURGOS CATHEDRAL, SPAIN

Founded in part by an English bishop in 1221, this shrine is one of the most richly ornate examples of Gothic architecture in the world. The octagonal lantern above the central crossing terminates in eight crocketed and perforated pinnacles adorned with statues of angels, martyrs, warriors, and princes. A relic of the Cid, Spain's national hero, is kept here.



THE INTERIOR OF THE CATHEDRAL AT TOLEDO

This view of the nave shows the trascoro, or rear of the choir, a typically Spanish adaptation of the Gothic ideal. The glories of Toledo lie within, not without; the carvings are unsurpassed for beauty and magnificence (see text, page 114).

THE VERJA, OR SCREEN, TOLEDO CATHEDRAL

Behind this exquisitely hammered screen is the High Altar, a small church in itself. A bewildering aggregation of small columns, niches, statues, foliage, and arabesques, painted and gilded with matchless splendor, extends to the vaulted roof and all around the sanctuary.

© Dr. Orrin S. Wightman

ST. ISAAC'S CATHEDRAL, PETROGRAD

The first shrine of All the Russias was begun in 1819. Inside and out, the gigantic proportions, the profusion of marbles, the brilliance of the gilding, the elaborate mural paintings, and the gleam of the polished pavement, produce a dazzling impression of beauty and magnificence. After Pompey's pillar and the column of Alexander in Petrograd, the 48 columns of the four porticos of St. Isaac's, 56 feet high and 6½ feet in diameter, are said to be the largest single stones which the hand of man has cut, rounded, and polished.

Photograph from Publishers' Photo Service

ST. STEPHEN'S CATHEDRAL, VIENNA

The lofty spire of St. Stephen's towers over an almost perpendicular roof made of brilliantly colored glazed tiles, many of which have been used in forming the conspicuous double-headed eagle, the Hapsburg coat of arms. This cathedral, begun in the twelfth century, is the finest Gothic edifice in Austria. In the second story of the tower is the great bell of 1711, weighing 20 tons. Beneath the church are extensive catacombs and the old imperial burial vault.

COLOGNE CATHEDRAL

Founded in 1248, this shrine was not completed until 1880. Its immensity, beauty of proportion, and wealth of decoration are celebrated. "Rows of massive flying buttresses, piers, pinnacles, spires, needles, crockets, towers, mullioned windows, portals, niches filled with figures, carvings, and grotesque gargoyles" produce an astonishing effect. Its twin spires soar to a height of 512 feet.

STRASSBURG CATHEDRAL

This ancient church, which in its present form represents the activities of four centuries, is built of red sandstone. Upon the three noble porches of the façade is recorded in stone the history of the Creation and Redemption. Among the churches of France, its north tower, rising to a height of 465 feet, is exceeded only by that of Rouen (see page 84).

© Donald McLeish

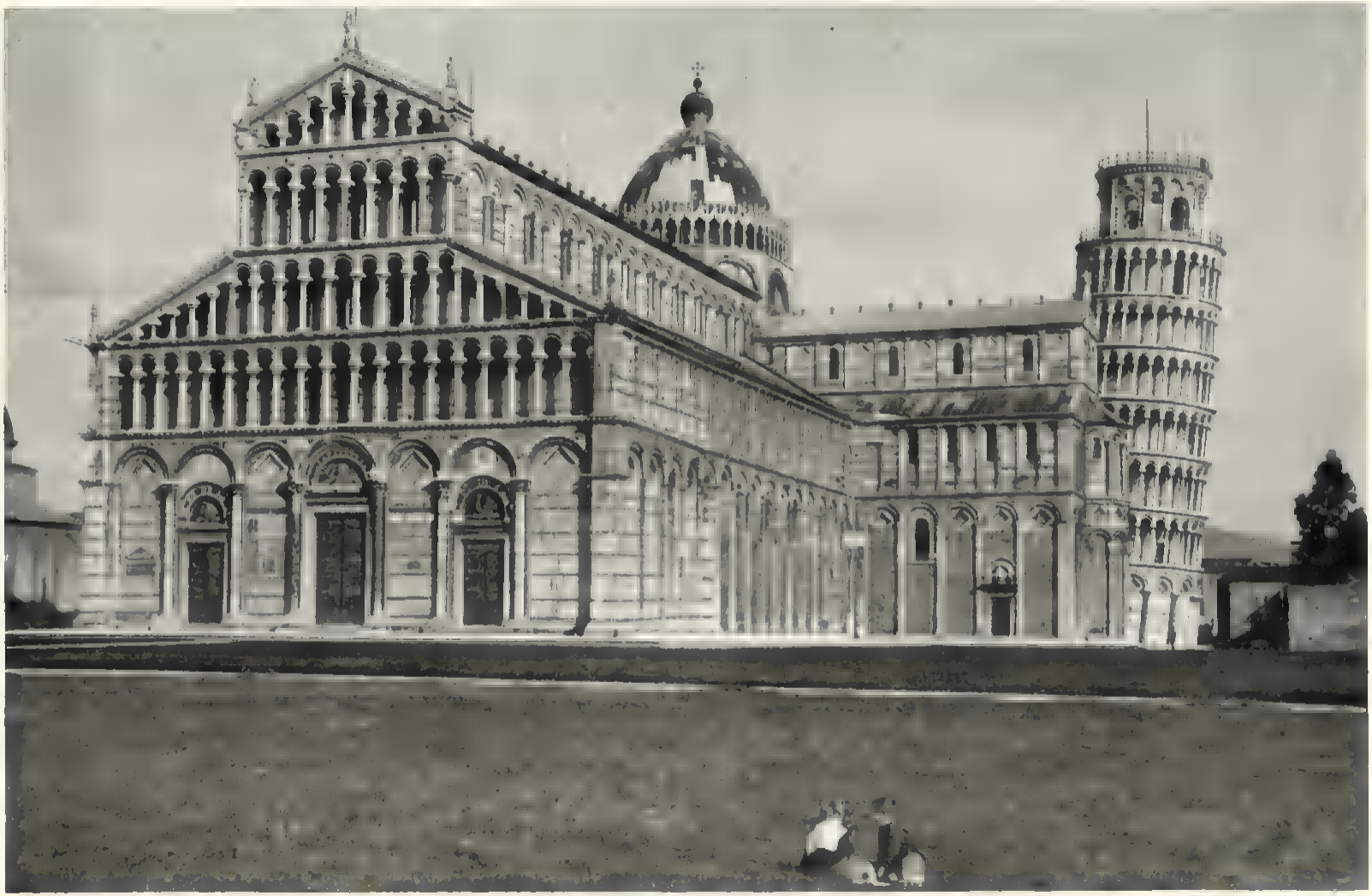
ST. PETER'S, IN ROME, THE LARGEST CHURCH IN THE WORLD (SEE PAGE 111)

Founded by the Emperor Constantine, the majestic edifice owes much of its splendor to Michael Angelo and to Raphael, who were engaged in its construction and decoration. The façade is surmounted by a balustrade with statues of Christ and the Apostles. The piazza in front is inclosed with huge colonnades, each of which contains four series of Doric columns.

© Donald McLeish

THE FAÇADE OF THE CATHEDRAL AT SIENA

Built between 1229 and 1380, Siena's shrine is of red, black, and white marble, richly decorated with statues of prophets and angels. Its façade is considered the finest in Italy. If the plans of 1340 had materialized, the existing building would have been only a transept of one of the largest cathedrals in the world. The remains of the huge nave of this proposed structure are still to be seen.



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THE CATHEDRAL AT PISA

This cathedral was built to commemorate the naval victory of the Pisans near Palermo in 1063. It is of white marble, ornamented with black and colored bands. The magnificent façade has been imperfectly imitated in other Italian cities (see text, page 111). Beyond is the Leaning Tower, the scene of Galileo's experiments.

© Donald McLeish

THE MILAN CATHEDRAL

With the exception of St. Peter's at Rome and the cathedral at Seville, this is the largest church in Europe. It is built entirely of white marble. The hundreds of spires and statues adorning the roof make the edifice appear like a huge carving. Begun in 1386, this structure has been proclaimed by many "the eighth wonder of the world."

© Donald McLeish

MARBLE SPIRES RISING FROM THE ROOF OF THE MILAN CATHEDRAL

These pinnacles are decorated with more than 2,000 statues, most of which are hundreds of feet above the streets. All are of marble and of the most delicate workmanship (see text, page 111).

© Donald McLeish

THE GREAT DOOR OF THE MILAN CATHEDRAL, WITH ITS WONDERFUL CARVINGS

The sculptured panel over the entrance represents the creation of Eve. Other scriptural events are depicted in stone on the side panels.

© Donald McLeish

THE MAIN PORTAL OF THE CATHEDRAL OF VERONA

Behind the columns and griffins are rough relief sculptures of Roland and Oliver, the famous paladins of Charlemagne. The nave and Gothic windows of this Romanesque structure of the twelfth century are of a later time. Beside the cathedral rises an unfinished campanile resting upon an ancient base. One of the priceless possessions of the church is a painting of the Assumption by Titian.

© Donald McLeish

THE PIAZZA OF VENICE, THE CHURCH OF ST. MARK, AND THE NEW CAMPANILE

The domes of St. Mark reflect a Byzantine influence. The new Campanile, 322 feet high, is an exact reproduction of the original bell-tower, begun in 874, which fell in 1902. Pigeons are said to have been kept in the square since the crusader Dandolo received valuable information by carrier pigeons while besieging Candia. They were formerly fed at the expense of the city, but are now dependent upon the charity of visitors.

VIEW OF FLORENCE SHOWING THE DUOMO, CAMPANILE, BAPTISTERY, AND THE PALAZZO VECCHIO

The Gothic dome of Our Lady of the Flower is comparable to the Renaissance dome of St. Peter's. It is remarkable for having been constructed without supports or scaffolding. Beside the church rises the Campanile, Giotto's unrivaled bell-tower, faced with many-colored marbles and adorned with statues and reliefs by Donatello and others. To the left is the tower of the historic Palazzo Vecchio, facing the Piazza della Signoria, where Savonarola was hanged on a cross and burned in 1498.

SANCTA SOPHIA, SACRED TO CHRISTIAN AND MOSLEM ALIKE

The total estimated cost of ground, material, labor, ornaments, and church utensils of this historic religious edifice, founded in 532 by Justinian the Great and completed in less than 6 years, was $64,000,000. Contributions came from all over the world, and its collection of priceless marbles, gold and silver vessels, and precious stones is unsurpassed. Legend says an angel revealed to the Emperor Justinian the plan for the mammoth dome.

THE "ST. PETER'S" OF MEXICO

The foundation of this massive structure of basalt and gray sandstone is composed almost entirely of sculptured Indian images and some of the remains of the great Aztec altar, or Temple of Sacrifice, that stood near by. It contains an original painting by Murillo, "The Virgin of Bethlehem." Among the peculiarities of the structure are the bell-shaped domes of the twin towers, which rise to a height of 203 feet.

impression of mysterious solemnity and majestic repose.*

FRANCE AND ENGLAND JOINTLY RESPONSIBLE FOR GOTHIC STYLE

The Gothic style found its most perfect expression in the French cathedrals of the thirteenth century and the English of the fourteenth, the French developing later the luxurious Flamboyant and the English the rigid but stately Perpendicular style.

Although France and England were conjointly the birthplace of Gothic, the new style exercised, as it was bound to do, a profound influence upon church architecture throughout the whole of Christendom, and notably in Italy and Spain. In each country it was modified by the climate, and bore the impress of the historic associations and the artistic tastes of the peoples among whom it was introduced—so much so, indeed, that we have come to speak of Italian and Spanish Gothic as individual types in cathedral architecture.

When the fires of persecution died down, and the early Christians of Rome were free to worship as they would, they found in the Roman Basilica or Law Court, with its central nave and side aisles, a building well suited to their simple form of service. To the Roman Basilica, therefore, we are indebted for the general plan of the Romanesque churches, of which Italy contains so many fine examples. These are characterized by the use of the round arch for door and window openings, and by the modified classic character of their details. Famous among such churches are St. Paul's Without the Walls at Rome, and the smaller but more beautiful cathedral at Pisa (page 102), whose blind arcades, open galleries, and many-colored marbles render its exterior one of the most elegant among the ancient churches of Italy. The oriental influence upon early Italian church architecture is seen in the use of the domical roof, as in St. Mark's at Venice (page 107), whose five domes and general treatment are suggestive of the Christian churches of the Byzantine Empire.

In spite of the natural preference of the Italians for the classic forms, to which they were drawn by the ties of a proud tradition, it was inevitable that the splendors of the new Gothic style would appeal to the artistic feeling and stimulate the rivalry of Italian architects. But in making use of the new style, they left upon it the deep imprint of their own traditions and tastes. Their genius for painting, carving, and sculpture led them to depend as much upon these arts as upon architecture for effect.

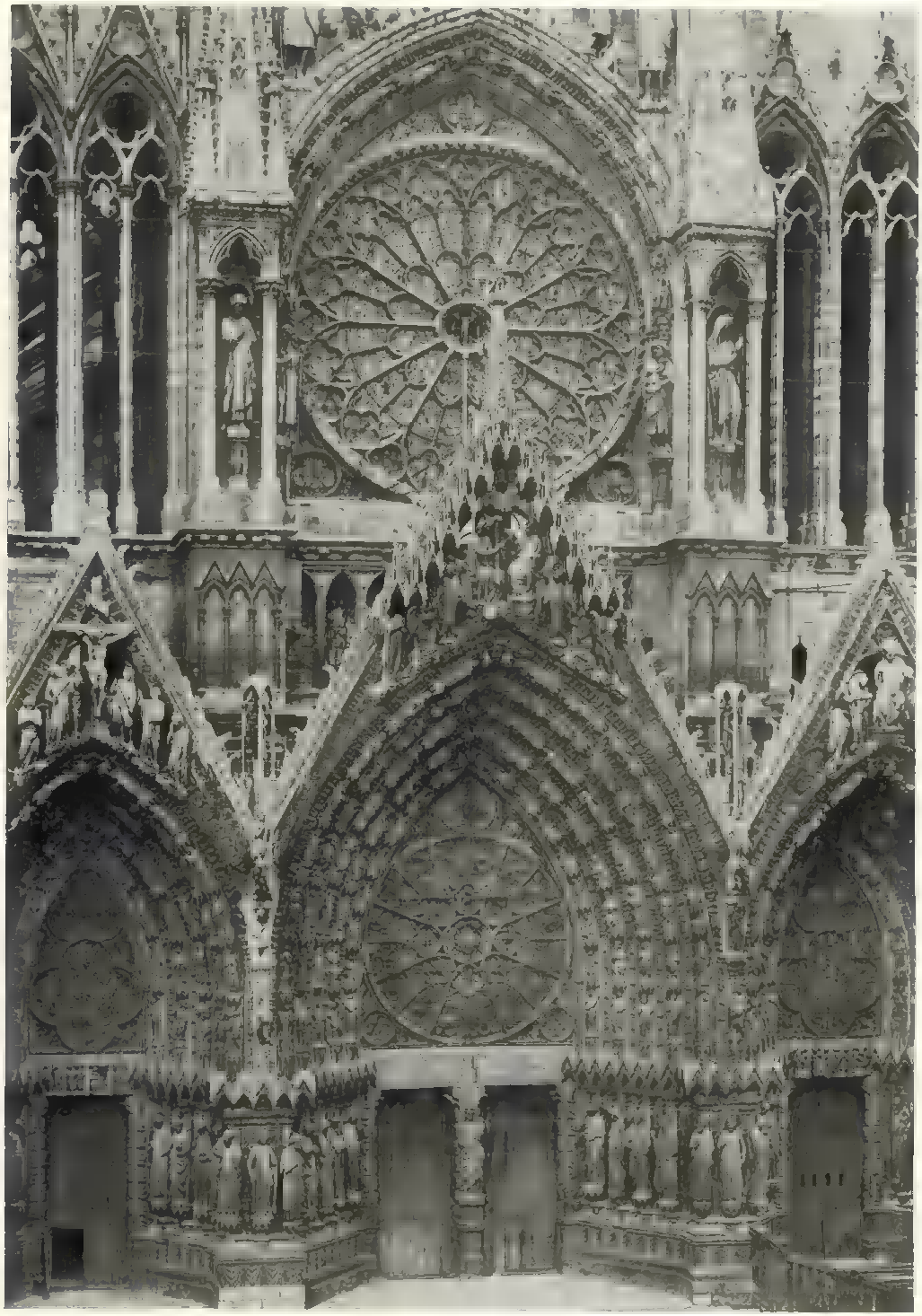
Partiality for the classic forms, moreover, caused them to include these, in modified form, not only in the details but sometimes, as in Milan Cathedral (pages 103, 104, and 105), as a main feature of the church itself; for here we have a Gothic church with a Gothic-Renaissance façade.

MILAN CATHEDRAL BUILT OF MARBLE

Milan has the distinction of being the third largest church in Christendom, a position which it will ultimately yield to the Church of St. John the Divine, at New York. Its nave is of vast proportions, being 60 feet wide and 150 feet from the floor to the apex of its vault. Milan has the distinction, moreover, of being built entirely of marble, and it is thoroughly Italian in the superabundance of its carving and sculptural adornment.

The Italian architects never seem to have been quite at home when working in the Gothic style; and when Pope Nicholas called for the erection of a church, upon the banks of the Tiber, that should transcend in size and magnificence the temples of all lands and of every age, the master architects of the day returned to their first love, and, working in the forms and using the orders of ancient Rome, they built the great Renaissance Church of St. Peter. So vast is this structure that it stands in a class by itself. With a total length of over 700 feet, it covers a ground area of 230,000 square feet. Next to it in size is the Spanish Gothic cathedral at Seville, with an area of 128,570

*In a subsequent issue THE GEOGRAPHIC hopes to present a detailed description of the National Shrine of the Immaculate Conception, another majestic religious edifice designed for the National Capital, the cornerstone of which was laid on the grounds of the Catholic University, September 20, 1920, and which, it is anticipated, will be completed within 30 years.



Photograph by Creté

DETAILS OF THE WEST FAÇADE OF RHEIMS CATHEDRAL

The west façade of this church, "perhaps the most beautiful structure produced in the Middle Ages," is the supreme example of elaborate decoration in the early Gothic style. The sides and overhead vaulting of the three recessed portals and the gables above them are beautifully adorned with sculptures and carvings. (Photograph made before the damage done during the World War; see also page 82.) The façades of the cathedrals of Notre Dame, Tours, Amiens, Strassburg, and Lichfield are similarly embellished.

© Donald McLeish

A LEERING GARGOYLE OF NOTRE DAME

Hobgoblins, chimæras, and quaint little beasts in stone are among the most fascinating features of the sculptural adornment of the Paris cathedral. This particular demon seems to be in a morosely pensive mood as he surveys the gay capital where he was wont to work such mischief before his capture.

square feet, followed by Milan Cathedral, with an area of 107,000 square feet.

The nave of St. Peter's is 100 feet wide by nearly 150 feet high; the great dome, internally, is 135 feet in diameter, with a clear height of 333 feet.

Italian Gothic may lay claim to having produced in the cathedral of Florence one of the greatest churches of the world (page 108). The genius of the Italians in the construction of domes has crowned this church with the noblest Gothic dome in existence, the octagon being 136 feet in diameter and 375 feet to the top of the external cross. Near by stands the lovely, marble-encased campanile of Giotto, regarded by many critics as the finest example of that tower construction in which, whether working in Romanesque or modified Gothic, the Italians excelled.

SPANISH GOTHIC WAS AN IMPORTATION

Spanish Gothic, like that of Italy, was an importation; and although in the period of its greatest development it was superior to the work of the Italians and more true to type, it bears, like the Italian, the strong imprint of national tastes and predilections, especially in its decorative enrichment.

At the time when the Norman bishops were covering Saxon England with their stately, round-arched, Norman cathedrals, Christian Spain, having shaken off the Moorish yoke, was actively engaged in erecting churches on a style that was not widely dissimilar to the early Norman.

Like the Norman, the early Spanish form of church probably was an introduction from France. Beginning as a round-arched style, it later adopted the pointed arch and assumed Gothic characteristics.

This early Roman-Gothic was simple, but bold and dignified. Perhaps its most distinctive feature was the development of the dome at the intersection of nave and crossing. The Spanish architects excelled in this construction, and have left some notable examples of their skill.

The finest examples of pointed Spanish Gothic belong to the "Middle" period, which lasted from about 1225 to 1425. Three of the notable cathedrals of the world, Toledo (pages 94 and 95), Burgos (page 93), and Seville (pages 90 and 92), belong to this period. The cathedral at Toledo, begun in 1227, a few years after the founding of Amiens, was designed to surpass that masterpiece in size and magnificence. Hence, everything is on the grand scale; and in area it exceeds every French cathedral, though its interior height is far below that of Amiens, Rheims, or Beauvais.

Externally, the architectural result is disappointing and not to be compared with the great French examples. The glories of Toledo lie within, not without. Its impressive interior, made up of five aisles with the unusual total width of 178 feet, is enriched with such a wealth of carving and statuary, wrought in the distinctive Spanish manner, that the result is bewildering and scarcely in keeping with the simplicity of true Gothic.

In Burgos the conditions are reversed; for, unlike Toledo, this church shows to best advantage from without. Although it is not a large church, as cathedrals go, Burgos is admitted to present one of the finest architectural exteriors in the whole range of Gothic architecture. The western towers, crowned with open-work spires (reminiscent of Cologne, page 98), with the richly-decorated octagons above the crossing and above the chapel at the eastern end, combine in a harmonious grouping, the picturesque beauty of which has never been questioned.

SEVILLE HAS LARGEST GOTHIC CATHEDRAL

The Cathedral of Seville (page 90) carries the distinction of being the largest and in some respects the noblest of all the Gothic cathedrals. Its plan, a parallelogram, 415 feet long by about 300 feet wide, followed that of a mosque which was torn down to make way for it. The area covered is about 123,000 square feet. No other Gothic cathedral approaches these dimensions. Not only is the central aisle nearly 60 feet in width, but flanking this, on each side, are two side aisles and a row of chapels, each 40 feet in width and therefore equal to the nave of most English cathedrals. The interior height is in proportion, and the whole effect of the many lines of massive columns is impressive to a degree that is not surpassed, in the opinion of many critics, by that of any other medieval Gothic cathedral.

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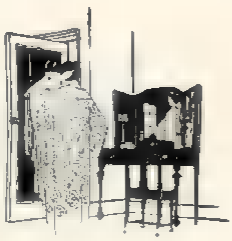

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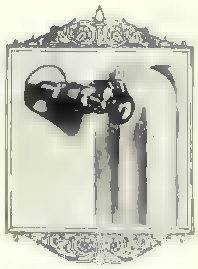

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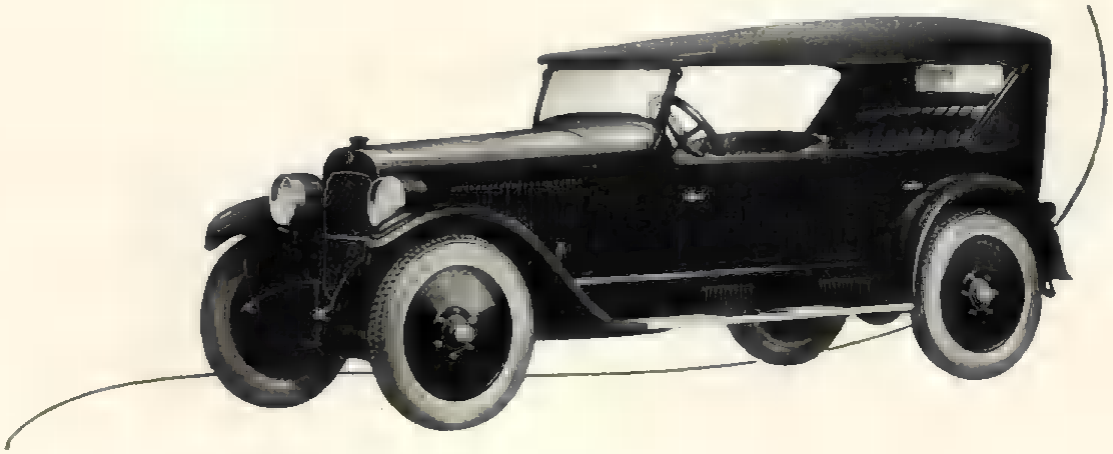

If you seek cars comparable with the Chalmers Six, your search will inevitably lead you to a much higher-priced class.

In its own price-range, the Chalmers is regarded as a car apart—a product far above and beyond the general run.

In other words, it is being awarded a distinct place of dominance in the minds of buyers and the general motoring public as well.

On the score of beauty-value alone, this position is firm and sound.

For the Chalmers is an unusually beautiful car—in design and in finish, with its disc wheels and general equipment.

In engineering-value, it represents a remarkable degree of six-cylinder perfection, developing possibilities which have long lain dormant in the six as a type.

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If you will recall the smoothest, most satisfying six-cylinder performance you have ever encountered, and then imagine the smoothness and satisfaction, the liveliness and flexibility, increased a good 50 per cent, you will have some measure of Chalmers Six performance.

One short ride in the Chalmers Six will reveal how much more it is, and how much more it gives, than is usually expected at its price.

All Models Equipped with Disc Steel Wheels and Cord Tires

Chalmers Motor Car Company, Detroit, Michigan

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CHALMERS
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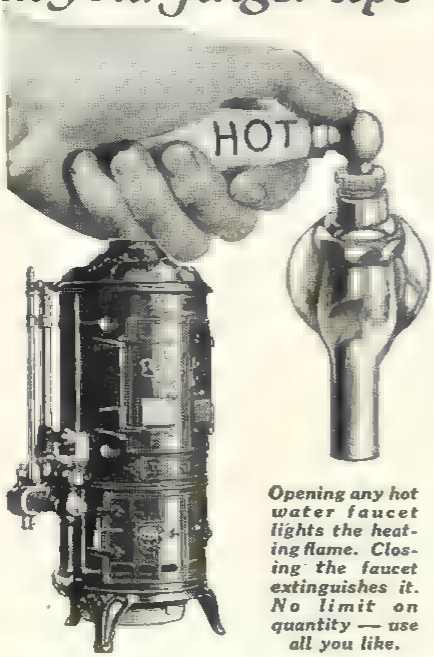
HOT WATER
at your finger tips



Opening any hot water faucet lights the heating flame. Closing the faucet extinguishes it. No limit on quantity — use all you like.

ABSOLUTELY nothing to do but open the faucet—when you have a Pittsburg Automatic. Then an intense heating flame leaps into action in the Pittsburg; as the fresh water flows through the copper coils in the heater it is heated *instantly*. Piping hot water —pure and fresh as the cold, and just as plentiful—flows from any hot water tap you open.

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Let us show you by a ten-day test how combating film in this new way beautifies the teeth.

Now your teeth are coated with a viscous film. You can feel it with your tongue. It clings to teeth, enters crevices and stays. It forms the basis of fixed cloudy coats.

Keeps teeth dingy

Film absorbs stains, making the teeth look dingy. Film is the basis of tartar. It holds food substance which ferments and forms acids. It holds the acids in contact with the teeth to cause decay.

Millions of germs breed in it. They, with tartar, are the chief cause of pyorrhea. Thus most tooth troubles are now traced to film. And, despite the tooth brush, they have constantly increased.

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Careful people have this film removed twice yearly by their dentists. But the need is for a daily film combatant.

Now dental science, after long research, has found two ways to fight film. Able authorities have proved their efficiency. A new-type tooth paste has been perfected to comply with modern requirements. The name is Pepsodent. These two film combatants are embodied in it, to fight the film twice daily.

Two other effects

Pepsodent also multiplies the starch digestant in saliva. That is there to digest starch deposits which otherwise may cling and form acids.

It multiplies the alkalinity of the saliva. That is Nature's neutralizer for acids which cause decay.

Millions employ it

Millions of people now use Pepsodent, largely by dental advice. The results are seen everywhere — in glistening teeth.

Once see its effects and you will adopt it too. You will always want the whiter, cleaner, safer teeth you see. Make this test and watch the changes that it brings. Cut out the coupon now.

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The New-Day Dentifrice

Endorsed by modern authorities and now advised by leading dentists nearly all the world over. All druggists supply the large tubes.

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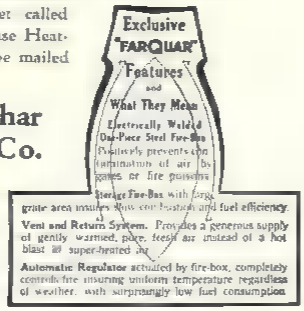
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Sani-Flush is sold at grocery, drug, hardware, plumbing and house-furnishing stores. Price 25c.

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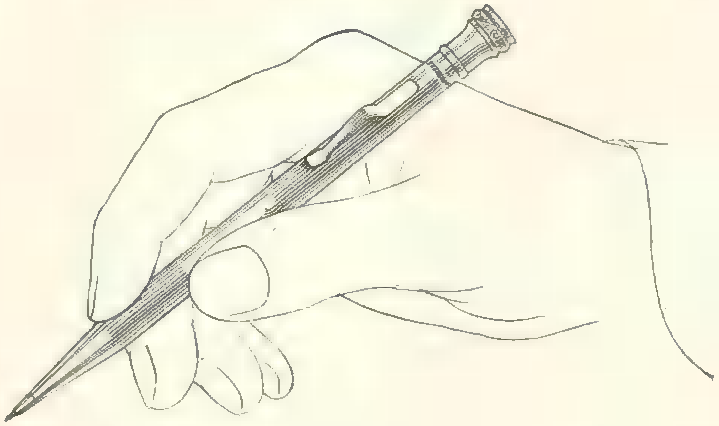

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HANDY ERASER UNDER THE CAP — NEW ERASER FREE WITH EVERY BOX OF EVERSHARP LEADS

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Wash and Bathe in Running-Water

Why a morning shower gives you a two hour start on the day

This applies especially to a cold shower. The clean, sparkling spray strikes the skin and contracts the surface blood vessels. This drives the blood momentarily towards the heart. Aroused to greater activity the heart drives the blood back again with still greater force filling even the tiniest blood vessel to its capacity, stimulating and invigorating the entire system—and then the water runs off. Besides being delightfully refreshed you are actually *clean.*

The Speakman Shower shown in the illustration is the H-952½; ideal in connection with the Deshler Bath fixture (the three handles) for either built-in corner or recess tub; has Mixometer and Anyforce Shower Head which put the shower's force and temperature under *instant* control of the bather. With this and many other types of Speakman Showers you can easily bathe without wetting your hair.

Let your plumber tell you about Speakman Showers. He will also give you a Speakman Shower Booklet, or write us. You might also ask your architect about Speakman Showers.

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FRANK'S
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MEDITERRANEAN

By Magnificent New Cunard SS. "SCYTHIA"

Specially chartered. Twin-screw Turbine Oil Burner. 21,500 Tons
Sailing February 6, 1923, returning April 9, visiting

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Madeira, Spain, Gibraltar, Algiers, Sicily,
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The "SCYTHIA" is a veritable floating palace, with spacious decks, lounges, veranda cafes, two elevators, commodious state-rooms with running water and large wardrobes; bed-rooms and suites with private baths. The famous Cunard cuisine and service. Only one sitting for meals.)

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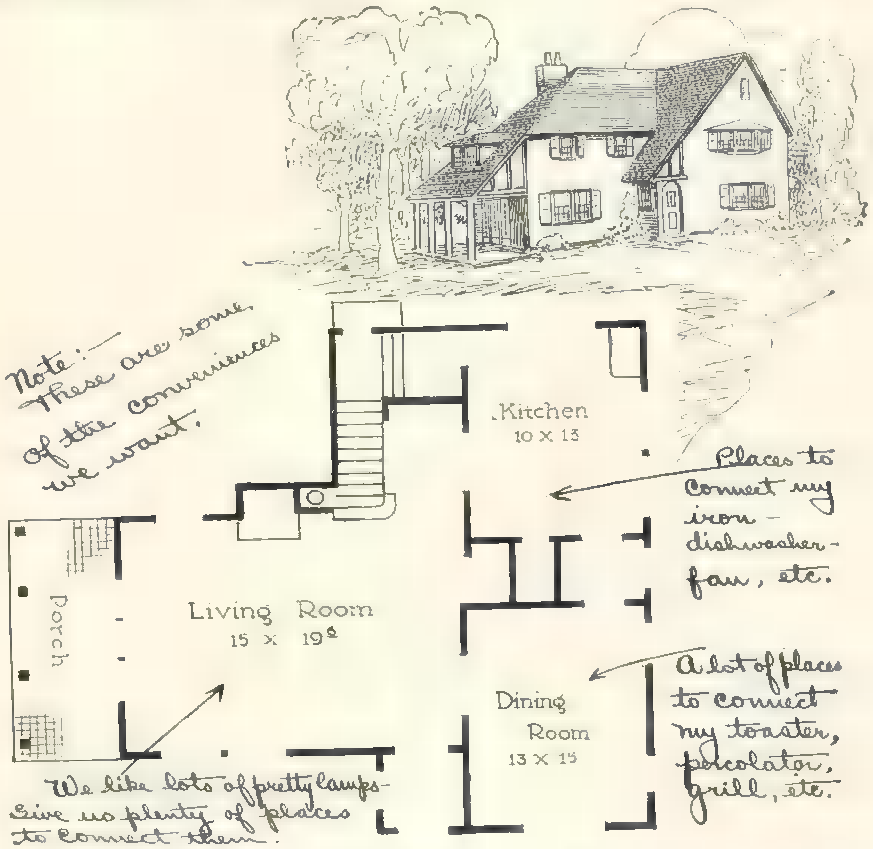
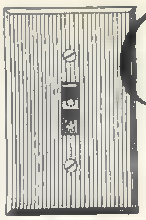


It's the Little Touches of Convenience that Make a Home



The G-E Tumbler Switch works with a touch of the elbow or a flip of the finger.

COMPLETE electrical convenience is just a matter of forethought. Above all things, you want the house you live in to be homelike—comfortable and convenient.

What can contribute more to your comfort and convenience than electricity properly applied?

Have switches in every room. Be able to control the upstairs lights from downstairs and vice versa; to light the garage or cellar from the kitchen.

With plenty of well located convenience outlets you can place attractive lamps wherever you wish. You can use several electrical devices all at the same time, if need be; a vacuum cleaner in any part of the house, a sewing machine where the sunlight is brightest, a chafing dish in your living room or den for those "clubby" little spreads.

These economical home comforts may be had in the house you are living in just as well as in a new one, for any qualified electrical contractor will do the work with little muss or trouble—and it costs very little more to have *complete* electrical convenience.

A New Booklet for Home Lovers

How to secure this electrical convenience in each room of your house is told in detail in a booklet prepared for you by household specialists of the General Electric Company.

This booklet will be sent you free, together with the name of a nearby electrical contractor qualified to assist you in planning adequate electrical convenience for your home.

If you own or rent a home, or ever expect to, you will find this booklet well worth reading.

What is Your Address?

General Electric Company

General Office
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Sales Offices in
all large cities.

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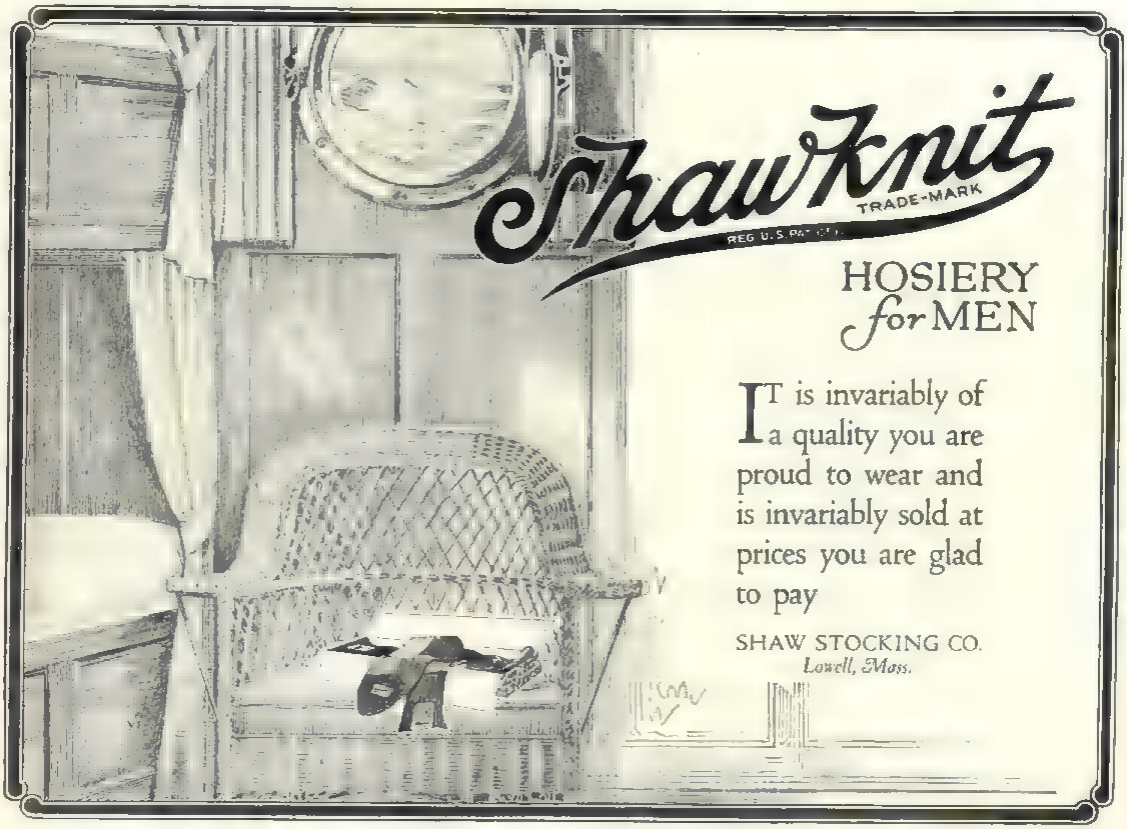
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7-22

Isn't this feeling about tires pretty universal

MOST car-owners intend to have a car the rest of their lives. Economical operation is getting more and more *fashionable.*

How many men do you know who won't expect *tires* to do *their* share of the saving?

This is the year for tire merchants to study their customers *closely.*

* * *

The makers of U. S. Royal Cords have recently stated what is the biggest opportunity to serve in the tire business.

U. S. Royal Cords cannot take care of all the people who want the *upward quality* in tires.

Nor do they claim a monopoly of all good tire making methods.

It is the things they refuse to leave *undone* that make U. S. Royal Cords the measure of all automobile tires.

Not only what is *put in* but what is *never left out*—that reveals the Royal Cord *practical ideal.*

* * *

So Royal Cord makers feel free to say again what they have said before—

Let us compete for higher and higher *quality.*

For more and more public *confidence.*

The makers of United States Tires urge upon everybody—manufacturer and dealer alike—a new kind of competition.

Let us compete for more and more public confidence.

Let us compete for higher and higher quality.

Let us compete for still more dependable public service.

United States Tires are Good Tires

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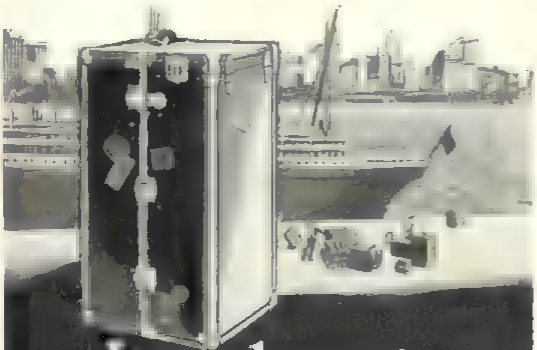
U. S. Royal Cord Tires

United States Rubber Company

Fifty-three Factories — *The Oldest and Largest Rubber Organization in the World* — *Two hundred and thirty-five Branches*



Is your baggage in danger?

Your baggage is continually changing hands, and is often where no one can be held responsible for its safety.

A North America Tourist Baggage Policy insures your baggage and also that belonging to members of your household against practically all the perils of transportation, assuring you prompt payment of claims. Insure by the year—it costs only a few dollars.

Mail the attached memorandum to us and we will send you full information.

Any insurance agent or broker can get you a North America Policy

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The Oldest American Fire and Marine Insurance Company

Capital $5,000,000 Founded 1792

MEMORANDUM (*Mail at once*)

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Send information regarding Tourist Baggage Insurance

To _____
(Name)

Address _____

Mention also any other form of insurance (except life) in which you are interested

A danger signal — tender and bleeding gums

HEALTHY teeth cannot live in diseased tissue. Gums tainted with Pyorrhea are dangerously diseased. For not only are the teeth affected, but Pyorrhea germs seep into the body, lower its vitality and cause many ills.

Pyorrhea begins with tender and bleeding gums. Then the gums recede, the teeth decay, loosen and fall out, or must be extracted to rid the system of the poisonous germs that breed in pockets about them.

Four out of five people over forty have this disease. But *you* need not have it. Visit your dentist often for teeth and gum inspection. And keep Pyorrhea away by using Forhan's For the Gums.

Forhan's For the Gums will prevent Pyorrhea—or check its progress—if used in time and used consistently. Ordinary dentifrices cannot do this. Forhan's keeps the gums hard and healthy, the teeth white and clean. If you have tender or bleeding gums, start using it today. If gum-shrinkage has already set in, use Forhan's according to directions, and consult a dentist immediately for special treatment.

35c and 60c tubes in U.S. and Canada.

Formula of
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FORHAN CO.
New York
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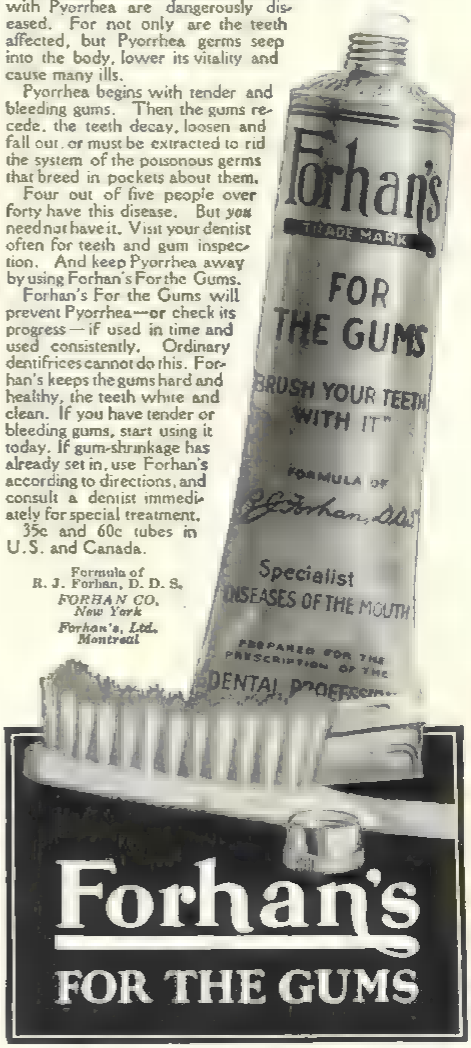
Montreal



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FOR THE GUMS

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4 MONTHS' CRUISE, $1,000 and up

Including Hotels, Fees, Drives, Guides, etc.

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65 DAYS' CRUISE, $600 and up

Including Hotels, Fees, Drives, Guides, etc. 1st days Egypt, Palestine, Spain, Italy, Greece, etc. Europe stop-overs allowed on both cruises.

Europe and Passion Play Parties, $500 up

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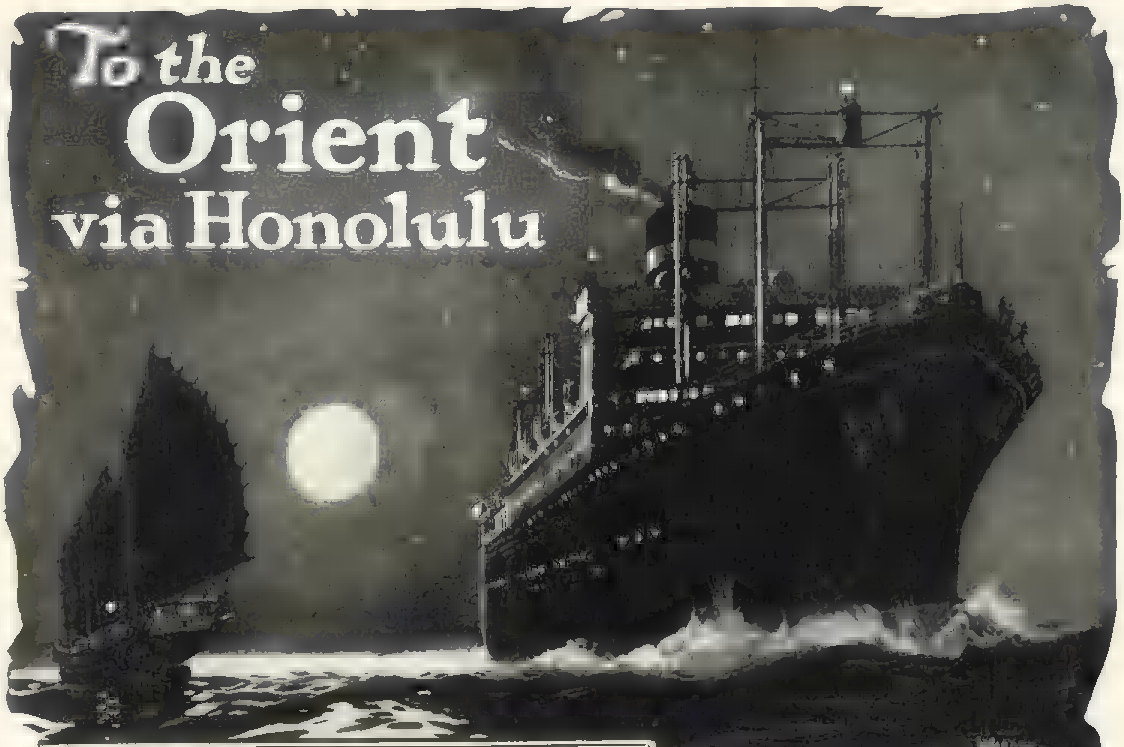

From San Francisco on American Ships

ARE you going to the Orient? Dreaming of moonlight in China Seas, the silent junks slipping into port, soft intoxicating airs, great stars ablaze in the velvet blue, all the mystery and lure of a tropic night—

Is this for you this year? Have you made up your mind to go? Then send the information blank below and read about Pacific Mail's famous "Sunshine Belt to The Orient." A day's stop is made at Honolulu. Stopovers may be arranged in any eastern port. Ports of call are Yokohama, Kobe, Shanghai, Manila and Hong Kong.

The ships are new oil-burners of 21,167 displacement tons owned by the United States Government, equipped with every modern convenience and luxury. **The service is Pacific Mail service—famous for 54 years among travelers to The Orient.**

For information in regard to sailings and accommodations, address

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Send the information blank below today for full information. You will also be sent without cost your Government's authoritative booklet giving facts every traveler ought to know.

INFORMATION BLANK
To U. S. Shipping Board
Information Division B155 Washington, D.C.
P. M.

Please send me without obligation the U. S. Government Booklet giving travel facts and also information regarding the U. S. Government ships.

I am considering a trip to The Orient ☐ to Europe ☐, to South America ☐.

*If I go date will be about*_____

*My Name*_____

*Business or Profession*_____

*Street No. or R. F. D.*_____

*Town*_____ *State*_____

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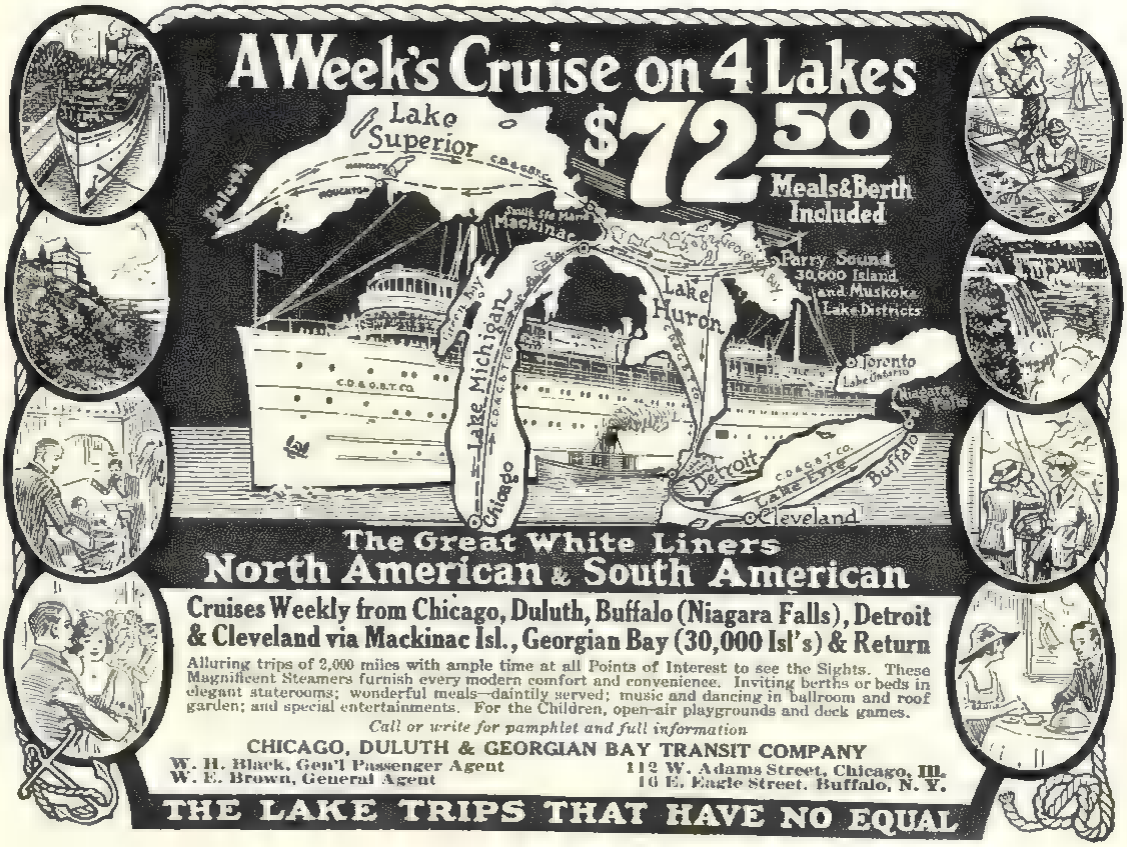
A Week's Cruise on 4 Lakes



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Alluring trips of 2,000 miles with ample time at all Points of Interest to see the Sights. These Magnificent Steamers furnish every modern comfort and convenience. Inviting berths or beds in elegant staterooms; wonderful meals—daintily served; music and dancing in ballroom and roof garden; and special entertainments. For the Children, open-air playgrounds and deck games.

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in New Mexico and Arizona Rockies by saddle and pack, team or auto

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Explore unbeaten trails across snowy mountains and along rushing trout streams. Traverse virgin forests and colorful canyons. Unusual Southwest outings. See the Indians of the Painted Desert and their weird ceremonies, including the Snake Dance. Will gladly help plan your trip. Ask for

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folder, containing maps, pictures, itineraries and approximate cost.

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Established 1845

YOUR memorial, above all other earthly creations, should represent your loftiest ideals.

Our long experience in building memorials of character helps us to appreciate and attain the results you desire.

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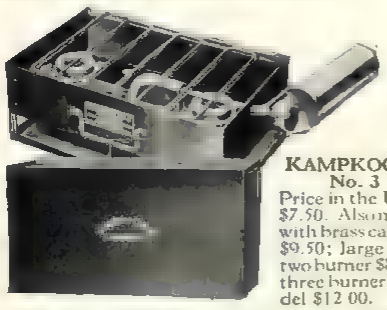
HARRISON GRANITE COMPANY, Inc.
200 Fifth Ave. New York

The QUICK, CLEAN WAY TO DO YOUR CAMP COOKING

GET out your Kampkook, remove the cover and light up. In two minutes you have ■ hot, blue gas flame; coffee steaming and bacon ■z-zling in less time than it takes to gather fuel for a wood camp fire. Kampkook makes its own gas from the same grade of gasoline you use in your car. Easy to light, windproof, safe anywhere. Most experienced tourists and campers cook the Kampkook way because it enables them to prepare a hurry-up lunch or a big meal anywhere, as quickly as in the home kitchen.

Kampkooks are sold by dealers in sporting goods everywhere. Write for folder on our complete line of Kampkooking Appliances.



KAMPKOOK
No. 3
Price in the U. S. $7.50. Also made with brass case at $9.50; large size two burner $8.50; three burner model $12.00.

IT'S ALL INSIDE. All Kampkooks fold up like a miniature suit case when not in use with all parts packed inside case, protected against loss or breakage.

American Gas Machine Co.
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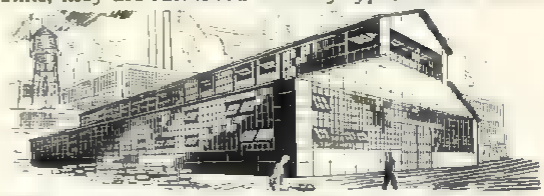
TRUSCON STANDARD BUILDINGS

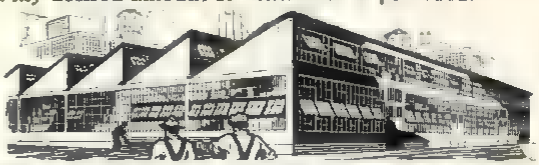
Exactly Meet Your Needs

The purposes for which Truscon Standard Buildings are being used are innumerable. Their economy, permanence, and adaptability are continually suggesting new uses. Made entirely of interchangeable steel units, they are furnished in many types and all sizes.



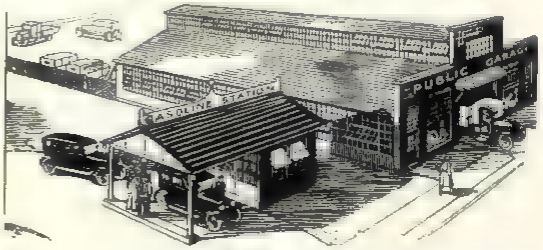
Warehouses and Foundries—

Fireproof, economical in cost, and quickly erected with minimum labor, Truscon Standard Buildings can be readily enlarged or re-erected with 100% salvage. Any desired amount of ventilation is provided.



Factories and Shops—

Well daylighted and well ventilated, Truscon Standard Buildings are being used in every industry, not only for large factories, but for every shop and manufacturing need. Also for storehouses, garages, time offices, cafeterias, etc.



Garages and Service Stations

—Truscon Garages designed with any desired front provide perfect ventilation, ample daylight, and unobstructed floor space. Truscon Service Stations are good looking, fireproof, and sturdy—readily dismantled and re-erected in new locations without loss.

Write for More Information—Learn how a Truscon Standard Building can serve your needs. Return coupon for valuable suggestions and catalogue.

TRUSCON STEEL COMPANY
YOUNGSTOWN, O. Warehouses and Sales Offices in Principal Cities

Send useful building book and suggestions on building to be used for_____.

Size____ ft. long,____ ft. wide,____ ft. high.

Name _____

Address _____ Dept. NG6

The birds are yours. Enjoy them!

Take the Book of Birds on That Trip

Think what a joy it will be for you and the youngsters to be able to name and describe *all* the birds you see on vacation trips or about your summer home! This open door to bird life, with its 250 full-color portraits of birds by Louis Agassiz Fuertes, enables you to identify winged creatures of woodland, field, and water. Henry W. Henshaw, the great protector of bird life and famous ornithologist, charms young or old reader as he discloses the life of our little singing neighbors.

200 Pages, Buckram, $3.00, Postpaid in U. S. A.

Foreign Postage, 25 Cents

An exquisite tribute to mankind's "Best Friend"

The Book of Dogs

Doesn't it add greatly to a summer stroll to be able to know the breed and tell the characteristics of the dogs you see on the road or in door-yards? And it flatters the dog owner when you begin to talk intelligently about his pet. Louis Agassiz Fuertes, with 100 dog portraits in natural color, teaches the varieties. Authoritative text supplements the pictures, and fascinating stories of dog devotion, sagacity, and heroism complete this "Bench Show in itself."

86 Pages, Buckram, $2.00, Postpaid in U. S. A.

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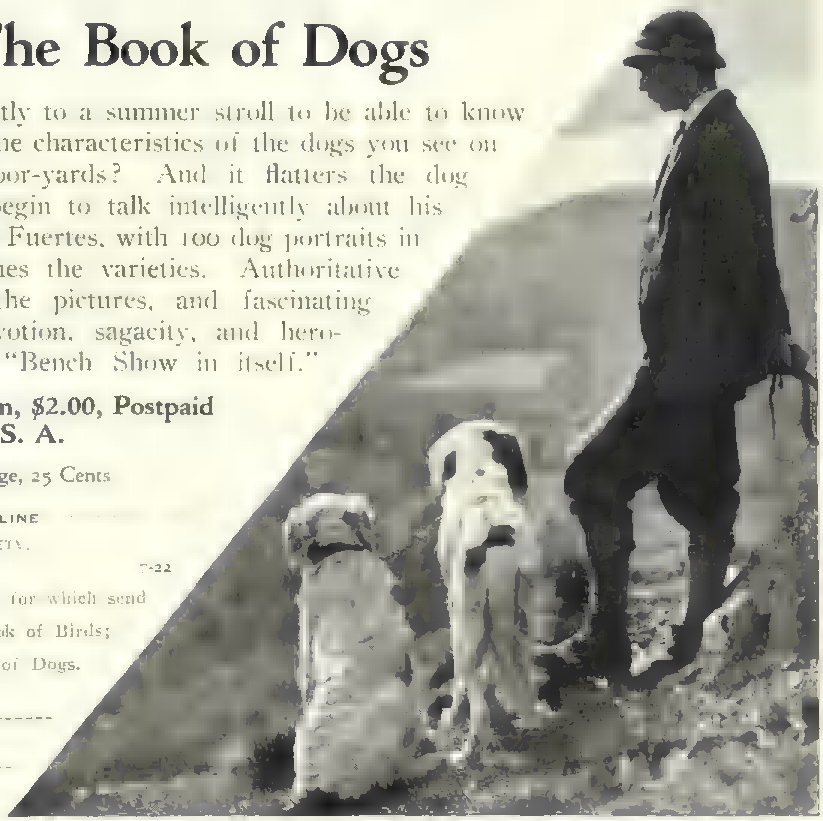

CUT ON LINE

NATIONAL GEOGRAPHIC SOCIETY,
Washington, D. C. 7-22

I enclose $_____, for which send

_____ copies, Book of Birds;

_____ copies, Book of Dogs.

Name_____

Address_____

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What Makes Cut Glass So Heavy?

BEAUTIFUL, sparkling like a diamond, cut glass is always a joy.

But why is it so heavy?

None but the informed would ever know. Cut glass is more than one-third lead. Thus lead plumbing, white-lead paint, and cut glass are in a sense all of one family.

The lead for cut glass (and for other fine glass, such as that for optical use, electric light bulbs, etc.) is first changed into lead oxide by burning it in a furnace. This oxide is known as red-lead. It is a reddish powder.

This powder, mixed with silica (fine white sand) and potash, becomes clear glass when melted in a furnace. At a lower temperature the molten glass is blown into various shapes.

This is only a minor use of lead in making modern life pleasant and comfortable, yet hundreds of tons of red-lead are used in this way every year.

Lead is also an important factor in the manufacture of rubber, and this means that there is lead in your overshoes, your automobile tires, fountain pen, pipe stem, and in dozens of other familiar articles containing rubber.

Civilization has found almost countless uses for lead, during centuries of experiment and progress, but it would be hard to find any other that is so important as the conversion of pure metallic lead into white-lead—the principal factor in good paint.

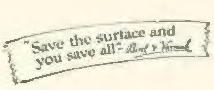
People are using paint more intelligently and more liberally today than ever before. They are recognizing the importance of the advice given in the terse maxim, "Save the surface and you save all."

The quality of a paint depends on the quantity of white-lead it contains. Some paint manufacturers use more white-lead, some less, in the paint they make. Most painters know that the most durable paint they can apply to a building is pure white-lead, thinned with pure linseed oil.

National Lead Company makes white-lead of the highest quality, and sells it, mixed with pure linseed oil, under the name and trade mark of

Dutch Boy White-Lead

Write our nearest branch office, Department F, for a free copy of our "Wonder Book of Lead," which interestingly describes the hundred-and-one ways in which lead enters into the daily life of everyone.



NATIONAL LEAD COMPANY

New York · Boston · Cincinnati · San Francisco
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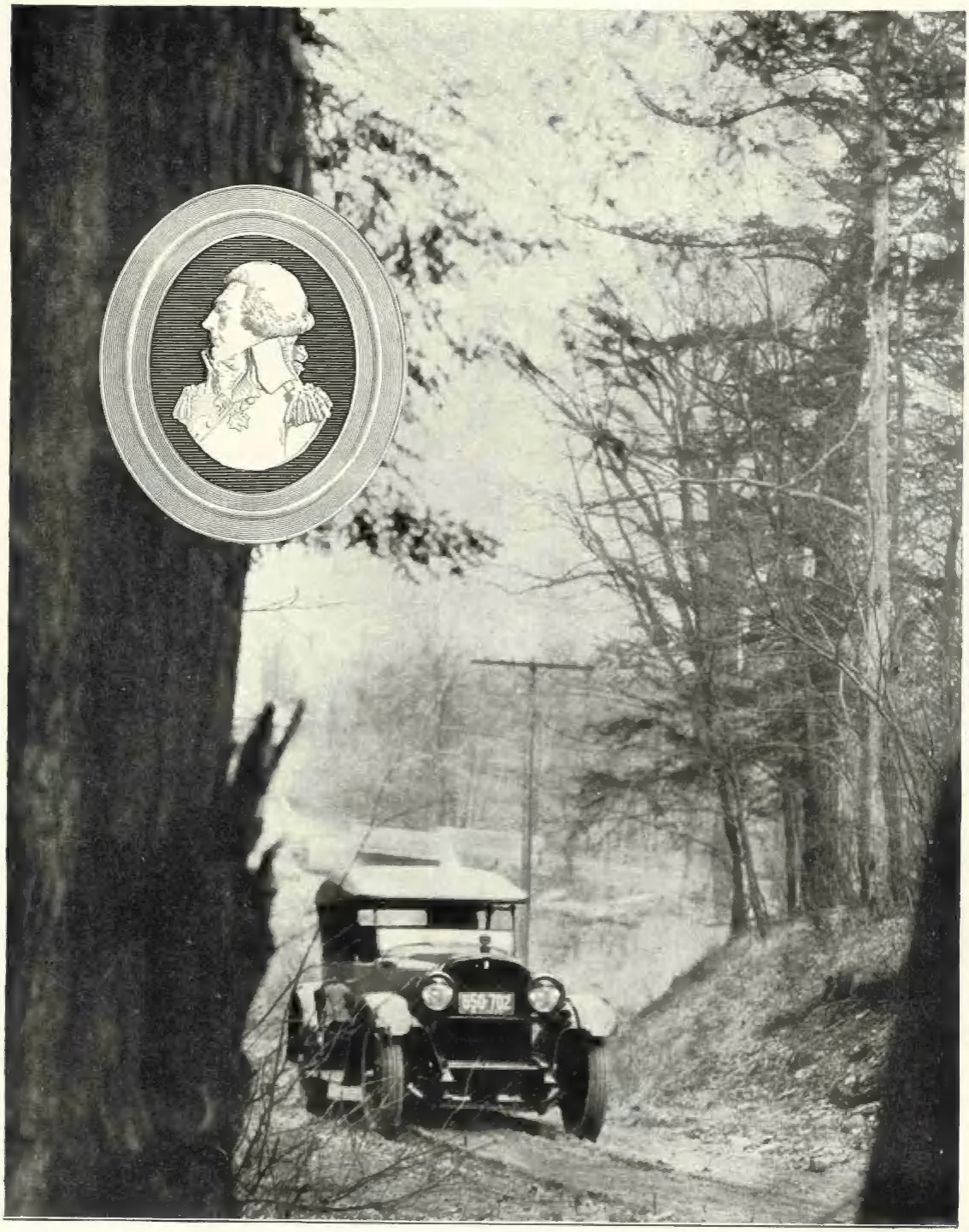
JOHN T. LEWIS & BROS. CO., Philad'phia
NATIONAL LEAD & OIL CO., Pittsburgh

Some Products Made by National Lead Company

Dutch Boy White-Lead	Hardening Lead
Dutch Boy Red-Lead	Flake White
Dutch Boy Linseed Oil	Lead Tubing
Dutch Boy Flatting Oil	Lead Wire
Dutch Boy Babbitt Metals	Litharge
Dutch Boy Solders	Type Metal

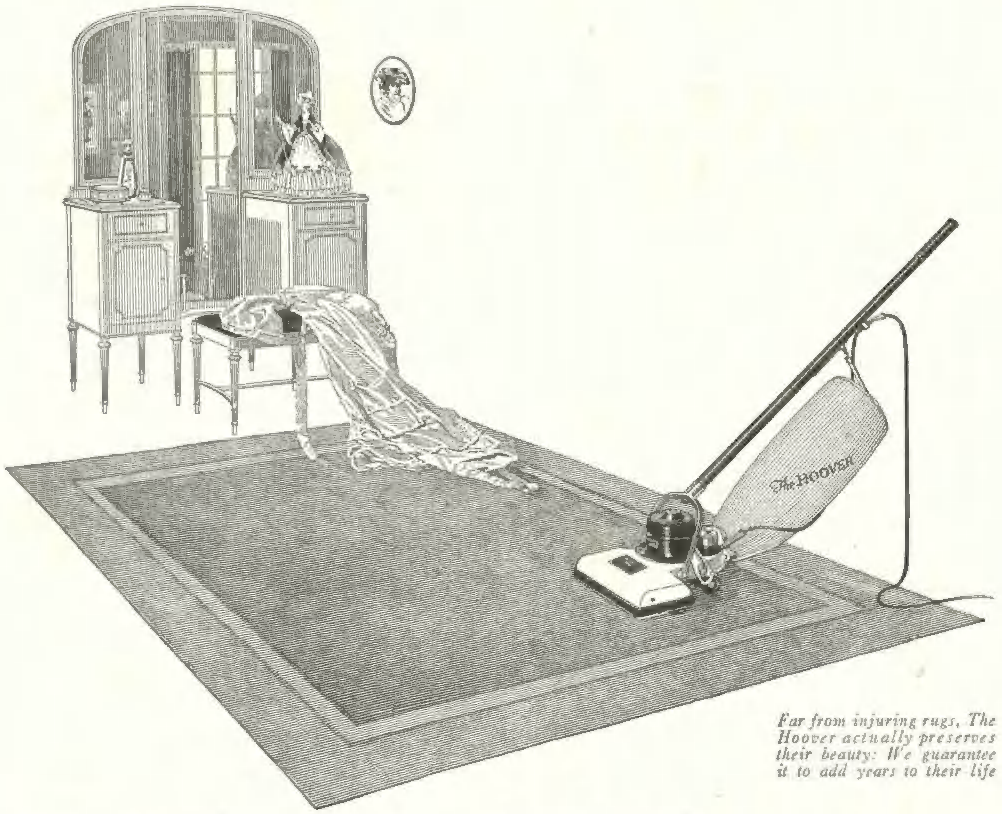
Glassmakers' Red-Lead



HE WHO OWNS A LAFAYETTE is envied by all who truly love fine things. Quiet, beautiful and strong, this car rules any road it travels.

LaFayette Motors Company, *at Mars Hill,* Indianapolis

LAFAYETTE



Far from injuring rugs, The Hoover actually preserves their beauty: We guarantee it to add years to their life

Why Take a Day to Clean House?

Why should *you* still devote a day of hard work, every week, to the cleaning of your home? Why should *you* tire yourself out, fill your lungs with dust and forego recreation—when so many other women have Hoovers?

It seems hardly fair. For you, too, could quickly, pleasantly and easily dispose of your cleaning, if you had a Hoover.

Without causing backache or scattering dust, this efficient cleaner sweeps up the stubbornest clinging litter!

Harmlessly it beats out of rug depths the hidden, germ-laden, nap-wearing dirt that otherwise escapes removal.

In addition, it erects crushed nap, freshens colors and powerfully suction cleans—all in one rapid, dustless operation which prolongs the life of rugs.

Easily connected air-cleaning attachments, of convenient new design, are provided to do your dusting dustlessly.

Phone any Tel-U-Where Information Bureau, any Hoover Branch Office, or write us for names of Authorized Dealers who gladly give free home demonstrations.

On our convenient payment plan, 23c a day soon pays for a Hoover. Made in three sizes, each moderately priced.

THE HOOVER SUCTION SWEEPER COMPANY
The oldest and largest makers of electric cleaners
Factories at North Canton, Ohio, and Hamilton, Canada

The HOOVER

It BEATS.... as it Sweeps as it Cleans

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

Is it the fault of the parents when children do not have good teeth?

DIET experts claim that the average person eats entirely too much refined food nowadays — food lacking in vital mineral salts.

Also, that the average man, woman and child eats too much soft, pasty food — food that can be swallowed whole — that robs the teeth and jaws of their proper task of grinding the food and preparing it for digestion.

The result is that a perfect set of teeth in a child more than 8 years of age is uncommon. And a *perfect* set of nerves in a man or woman of 30 or more is almost as rare.

We Are What We Eat

Your doctor can tell you that your physical well-being, as well as the strength and vitality of your nervous system, is largely a matter of *food*.

This is why it is so important for parents to establish a correct diet in the formative period of their child's life—at the time of the child's most rapid growth.

What to Give the Children to Build Them Up

One of the best and most complete foods you could possibly give to children is Grape-Nuts — the rich, cereal food made from whole wheat flour and malted barley.

Grape-Nuts contains calcium, potassium, magnesium, iron, phosphorus and other mineral elements that go to build up sound teeth and bones, and sure, steady nerves.

Eaten with cream or milk, to supply the necessary fat, Grape-Nuts is a *complete* food—filling every requirement of tooth, bone, nerve and muscle building.

The crisp, nourishing granules of Grape-Nuts afford the teeth and gums the proper, normal exercise that they require, if the teeth are to remain sound and healthy.

Because of its vital mineral salts, and because it stimulates proper mastication, Grape-Nuts is one of the best foods for developing and preserving the teeth.

A Delicious Nut-Sweet Flavor

And please do not overlook the fact that the world-wide popularity of Grape-Nuts is due equally to its delicious nut-sweet flavor and crispness and its satisfying wholesomeness.

Go to your grocer today and order a package of Grape-Nuts. Serve it with milk or cream for breakfast. Or with sliced peaches or stewed fruit, for a luncheon dish. Or make up a delicious, appetizing Grape-Nuts pudding for supper, that every member of the family will relish.

Grape-Nuts can be had in the leading clubs, hotels, restaurants and lunch rooms throughout America. And it's the same Grape-Nuts you get in the Yellow package from your grocer.

"There's a Reason" for GRAPE-NUTS

Made by Postum Cereal Co., Inc., Battle Creek, Michigan